MOTOR AGE

Vol. XXIX
No. 9

CHICAGO, MARCH 2, 1916

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MOTOR AGE

Published by the
CLASS JOURNAL COMPANY
910 South Michigan Avenue
CHICAGO ILLINOIS

NEW YORK OFFICE, 239 West 39th Street

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, Under Act of March 3, 1879—Member of the Audit Bureau of Circulations. Circulation Audited and Verified December 8, 1914—Copyright by the Class Journal Co., 1916.

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DEPARTMENTS

—NEXT WEEK—

"The Magic of the Motor Car Factory," which will be the subject of the issue of Motor Age for March 9, leads the reader through the vast plant in which his car, or one much like it, is made, and explains the mysterious processes of large-production plants.

BOYS

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Vol. XXIX, No. 9 Chicago, March 2, 1916 $3.00 Per Year

MOTOR AGE

Dixie's Call for Cars

By Charles C. Swearingen

AT the very door of the bulk of the American motor car factories lies a great consuming territory which holds immense possibilities for their sales organizations. This territory is in the South with an area of one-third of the total area of the United States, and a population of about 35,000,000. The people of this rich region have drawn $10,000,000,000 of wealth from the rich coffers of their land.

This money demands an outlet through the buying of all the necessities and luxuries the country can supply. Of this sum, $1,000,000,000 comes from the cotton crop—$720,000,000 from the lint and the balance from the products of the seed.

The close of the year found spot cotton future contracts 4½ cents higher than one year previous, or a minimum gain of $25 per bale. Some are predicting 15-cent cotton by spring and 20-cent by January 1, 1917.

No Longer One-Crop Land

The European war has taught the southern farmer a great lesson, for it is no longer a one-crop land. During the past year the doctrine of crop diversification has been spread to the four corners of Dixie.

In evidence of her emancipation from the slavery of cotton there is the significant fact that the value of the grain crop produced by the South last year was $1,330,000,000, which is $100,000,000 in excess of the value of the most profitable cotton crop ever gathered.

The South produces 88 per cent of the total tobacco crop; 28,000,000,000 feet of the total of 31,000,000,000 feet of lumber manufactured in the United States last year came from the South; she produces 75 per cent of the cooking coal; 41 per cent of the zinc; 42 per cent of the lead; 80 per cent of the phosphate, and produces fifty-five of the fifty-seven useful minerals mined in the United States.

In the Banks

The new South is a growth of a scant 50 years out of the ruins of war, while the stable institutions of New England have thrived undisturbed for centuries. Comparing the two sections, the people of the South had a few weeks ago on deposit in national banks alone $735,561,874. New England had demand deposits of $484,654,630; the South, $586,155,168. New England

had time deposits of $73,175,851; the South $149,406,705.

Commercially, industrially and agriculturally the South has grown faster during the last decade than any other section of the country. The population of the South in 1910 was about 30,510,000, and during the past 5 years, population has increased at the rate of 16 per cent. Outside of the main centers of density, where there is a natural growth of large proportions, regardless of accretions from the outside, no other section of the United States has shown a larger growth during the period named.

With no design or inspired relation, news stories are appearing in the daily press singularly consistent and of one note, in their relation of a healthy activity and industrial condition throughout the southern states.

This year, as a result of their labors, the people of Dixie have more wealth than they ever had at the close of any year. The money constitutes a factor that cannot be neglected by the campaigns of the motor car industry. There are few motor car factories in the South. Alabama, Arkansas, Florida and South Carolina have none. Kentucky, Tennessee and Texas have three each, while Louisiana, Virginia, Georgia and North Carolina each have one factory within their borders. They cannot supply the demand.

That the factories are beginning to awaken to the possibilities in the South is shown by the fact that the manufacturers who have no representatives in this territory are sending traveling men to the big distributing centers to establish an office or branch, or to make contracts with a new dealer or distributer. Hardly a day passes but that one or more sales managers or factory representatives arrive in Louisville on this mission.

King Cotton a Prosperous Monarch

PRODUCTION OF COTTON

STATES	Upland cotton bales.	Sea-island cotton, bales.	Linter's, bales.	Total.
Alabama	1,012,966	.....	60,700	1,073,666
Florida	27,038	28,047	2,500	57,585
Georgia	1,865,624	56,722	118,000	2,040,346
*Kentucky	.....	.....	.....	.....
Mississippi	898,414	.....	60,400	958,814
Louisiana	333,908	.....	20,622	354,530
Tennessee	286,525	.....	32,250	318,775
Total production	4,424,475	84,769	294,472	†4,803,716
Average weight per bale	500	390	510	
Average price sold	11¼c	25c	6c	
Total valuation	$248,876,718.75	$8,264,977.50	$9,010,843.20	

*Kentucky is classed in with other States, the production of that territory being insignificant.

NINETEEN fifteen stands out prominently as a motor car year in the South. The average percentage of increase in 1914 over the preceding year was 51 per cent, while that for the whole United States was 39.6 per cent. Definite figures in some states south of the Mason and Dixon line are unobtainable by reason of the fact that some have paid no tax and others have had different ways of taxing cars. Perhaps this wide variation is no better exemplified than in Mississippi and Louisiana. Official records of these two states were conspicuous by their absence in 1914 and therefore the percentage of increase shown in 1915 by these two states—210 for Louisiana and 195 for Mississippi—may not be exact, but the 1915 total is correct, since more adequate records now are kept.

Florida stood at the foot of the class when the 1914 and 1915 figures were compared. This state showed an increase of 1,757, whereas Alabama showed 5,373, Georgia, 3,259 and Kentucky, Louisiana, Mississippi and Tennessee gained over 7,000 each.

Making a comparison of registrations for the last 5-year period shows some interesting facts. From a modest total of 1,240 cars in 1911, Mississippi had rolled up a total of 1,155 at the end of 1915. Tennessee leads the South in motor cars, having a total of 27,266 on December 31, 1915, although registering but 6,464 in 1911. Her increase for 1 year was greatest in 1915, when nearly 8,000 cars were added. Georgia is second in the South with 24,059, although in 1912 it boasted first place, having 12,240 cars to its credit.

Putting the figures for seven of the Southern States under the glass shows that from a total of 34,424 cars in 1911, the same states have added to their supply until they now have 120,126 cars, a gain in 5 years of 85,702.

Getting down to the ratio between population and cars, Florida seems to have the edge, although her small population naturally puts the equation closer. Were it possible to put sixty-seven persons in one car, the entire population of Florida could go joyriding at one time in the cars registered in that state. Next in rank comes Tenessee, with a population of eighty-four persons for every car owned in the state. Georgia and Kentucky follow next in order. Then comes a peculiar coincidence: the population per car of Mississippi and Alabama is the same while that of Louisiana is but one lower. The average population per car in the seven states mentioned is 120, while that for the whole United States is forty-two.

STATE	REG. 1914	REG. 1915	CAR INC.	CENT INC.
Alabama	8,425	13,798	5,373	64
Florida	11,366	13,123	1,757	15
Georgia	20,800	24,059	3,259	16
Kentucky	11,746	19,500	7,754	66
Louisiana	3,500	10,880	7,380	210
Mississippi	3,894	11,500	7,606	195
Tennessee	19,668	27,266	7,598	39
Total	79,399	120,126	40,727	...

Average per cent increase, 51.
Average for United States, 39.6.

STATE—	POPULATION	CARS	POP. PER CAR
Alabama	2,316,943	13,798	168
Florida	882,148	13,123	67
Georgia	2,836,177	24,059	117
Kentucky	2,372,412	19,500	121
Louisiana	1,815,218	10,880	167
Mississippi	1,939,226	11,500	168
Tennessee	2,279,691	27,266	84
Total	14,441,815	120,126	
Average pop. per car			120

Average population per car for the entire United States is 42.

It would appear from the foregoing figures that the South has found the need of cars more in the last year or 18 months than at any time previously. It also is evident that though the average gain in 1915 over 1914 in purchase of cars was 11.4 per cent greater than the mean average for the whole United States, the South will have to purchase many cars before the ratio between population and cars owned will get within hailing distance of the general average for the United States. If that be true, and the spirit shown in 1915 emanated from sound reasoning, the South is going to be a very fertile field for the motor car salesman in the years to come.

The majority of dealers have a larger

Growth of Motoring in South

REGISTRATIONS BY YEARS

STATE—	1911	1912	1913	1914	1915	Increase 5 yrs.
Alabama	2,856	3,385	5,435	8,425	13,798	10,942
Florida	3,889	6,749	8,372	11,366	13,123	9,234
Georgia	12,240	19,120	18,500	20,800	24,059	11,819
Kentucky	2,868	5,147	7,210	11,746	19,500	16,632
Louisiana	4,867	7,000	7,200	3,500	10,880	6,013
Mississippi	1,240	2,895	3,000	3,894	11,500	10,260
Tennessee	6,464	9,973	14,103	19,668	27,266	20,802
Total	34,424	54,269	63,820	79,399	120,126	85,702

Louisiana's report for 1914 was not complete, owing to a new law going into effect about the time the census was made. The same applies to Georgia's statistics for 1912.

list of live prospects who have promised to sign up this spring than ever before. The lack of deliveries has cost several dealers good sales. As a rule, the southerner is slow to make up his mind upon the question of buying a car, but once settled, he wants the machine immediately. When he can't get a certain make he wants, he visits another garage and finds another car in the same class that will satisfy him.

Lumber a Mainstay of South

STANDING out prominently among the resources of the South is its contribution to the lumber-consuming world. The South may be said to have three leading industries—lumber, cotton and steel. Of the three, lumber is second only to cotton in the matter of dollars and cents. Ranking high among the lumber-producing sections of the United States, being a locality in which conservation of timber, perhaps, has not been adhered to more than in other regions, but by reason of a vast visible supply, standing well near the top of the ranks of future production, the South today is contributing a lion's share of the aggregate footage of lumber consumed in the central, southern and eastern states, as well as sending millions of feet over seas every year.

The foregoing being true, it is not to be wondered at that advocates of the Greater South point with pride to its vast buying power in the commercial world. It is true that in the river sections of the southern states difficulties arise which must be considered when comparing the natural advantages of other sections, nevertheless, the South, taken as a whole, must attribute much of its financial showing to the fact that the activity in the lumber industry is at its height. There is a visible supply of timber in the South to last many years yet, if proper conservation is practiced, and with the federal government co-operating with timber owners, educating them to take from the forest, theoretically speaking, all that the packer takes from the hog—it is frequently heard that all the loss in pork packing is the squeal of the hog—it seems quite likely that the people south of the Ohio river will not see the forests depleted for several generations.

The consensus of opinion at the present time, according to several leading figures in the lumber industry of the South who are in a position to know, is that the lumber industry is on the eve of a period of prosperity, the equal of which has not been approximated in several years. Granting that this is true, other lines of business should prosper. The man who sells motor cars should find fertile fields for his selling campaign during the coming year. True the sections along the Mississippi have suffered some from floods, but that is no unusual thing and this year's inundation has been less severe than on several occasions.

After a period of depression extending over the last year and a half, building activity has taken on a new impetus and in consequence new mills, bigger production plans and greater selling campaigns in the lumber industry of the South are the order of procedure. The good showing of the early part of 1914 was robbed to offset a declining market after the first of July that year. The avenues of trade shrunk until they became mere alleys and in some cases ceased to exist. Then followed another 12 months in which business grew somewhat and while the latter half of 1915 was far better for lumbermen than they had anticipated, the gain was not sufficient to put production back on the basis from which it was routed at the beginning of hostilities abroad. In support of this statement, note the table given herewith, showing the production of lumber in board feet in 1914 and 1915 from the several states south of the Ohio river and east of the Mississippi.

	1915	1914
Arkansas	992,292,000	1,022,874,000
Texas	1,226,129,000	1,231,166,000
Louisiana	2,999,430,000	3,102,055,000
Mississippi	1,196,444,000	1,279,181,000
Alabama	596,550,000	662,638,000
Georgia	235,554,000	275,190,000
Florida	646,892,000	620,769,000
South Carolina	370,180,000	311,960,000
North Carolina	625,492,000	628,340,000
Virginia	259,772,000	231,800,000
West Virginia	530,119,000	572,320,000
Kentucky	100,479,000	112,819,000
Tennessee	159,868,000	211,496,000
Total	9,939,201,000	10,262,608,000

Business done so far in 1916 is far ahead of that of the preceding year and it appears that the predictions of the lumbermen of the South are to be realized. The South has bought many cars in the last year and with a healthy tone of optimism to the so-called barometer of trade, it augurs very well for the sale of cars during 1916.

Granting that $10 a thousand feet is an average price of lumber at the mills, the foregoing figures show that approximately $100,000,000 came into these states during both of these years.

Lumber and lumber products should bring into the coffers of the south from $1,000,000 to $200,000,000 during 1916. The percentage of this that is turned over to dealers will be governed very much by their aggressiveness.

Railroads are buying timber for making cars and much of this material comes from the South. Longleaf yellow pine is specified in a great many cases and the railroads are preparing for a new era of prosperity in general. When the railroads begin to add to their equipment, especially the complement of freight cars, it means that they are practically sure that there will be need for them. Every railroad leading into Chicago, almost without exception has contracted with car makers or for material for the construction of additions to their rolling stock, especially freight cars.

Probably the South is more prolific in wood varieties than any other section of the United States. Two of the more common are yellow pine and cypress.

Yellow pine goes into building construction in large quantities. Certain grades go into the manufacture of boxes. Cypress found along the Gulf of Mexico and the lower Mississippi is used for nearly every purpose. Being known as "the wood eternal" it comes in as a building material in large quantities and by a burning and scouring process finds a place high in the estimation of users of interior finish, since the grain is given in relief after treated in the manner mentioned.

Kentucky and parts of Tennessee are in the hardwood region of the South. Red and white oak is found there in large quantity and as to their uses, one has but to look on every side to find them. Poplar and cotton, as well as sycamore are used considerably in interior finish, boxes and for pattern-making to some extent.

The Atlantic states have another grade of pine, known as North Carolina pine, which is quite similar to longleaf yellow pine, while Georgia has a species all her own, very hard and finding a place in all the uses to which longleaf yellow pine generally is put. Some sections of the southeast produce walnut and other fine finishing woods, but the supply of these is more or less limited.

Two Kentucky Staples

KENTUCKY, with a gross area of 40,598 square miles, had a population in 1910 of 2,289,905. It ranked fourteenth among the forty-nine states and territories.

In 1909, from the last government figures available, the total value of the manufactures of the state, exclusive of the products of the neighborhood and hand industries, amounted to $223,754,000.

Kentucky, because of immense whiskey production, pays Uncle Sam the fourth largest revenue in the United States. Of the total of $33,653,848 paid by this state in 1915, according to the internal revenue

commissioner's report, the biggest item was $28,642,911 from distilled spirits, this being about one-fifth of the amount collected from this source for the whole country. In addition to this, fermented liquor which was made in the Blue Grass state paid nearly $1,000,000 to the inter- 1915.

These figures, to some extent, give an idea of the importance of liquor-making in a state famous from its earliest days for this industry. It is estimated that the operating capital of Kentucky distilleries aggregates something like $125,000,000.

The report of the United States repartment of agriculture estimated the 1915 tobacco crop in Kentucky at $27,899,200. Tobacco today is selling from one to four cents higher than it was a year ago.

This means prosperity in Kentucky, for tobacco is one of the state's chief products, and there is no question but that a big tobacco business results in a greater demand for cars.

Iron and Steel in Dixie

DIXIE makes important contributions to the great iron and steel industry, especially Alabama, Georgia, Kentucky and Tennessee, Louisiana and Texas also deserving some mention in this particular. There are seventy-six blast furnaces in the six states, of which forty-nine were in operation a year ago, their combined output of pig iron being 2,280,070 tons, as compared with a capacity of 4,885,400 tons for the year. There are fifteen steel works, of which twelve were active a year ago, their total output for the year showing 737,037 tons of steel ingots and castings, the total annual capacity being 1,443,225 tons. Of twenty rolling mills, seventeen were working a year ago, their production for the previous year totalling 626,305 tons of rolled iron and steel products for the six states. The 5,328,911 tons of iron ore produced in this district during the same year, combined with the 44,809,714 tons of coal and 3,816,752 tons of coke, serve to give an idea of the magnitude of these industries in this region.

Alabama is the leader, having forty-eight blast furnaces, of which thirty were in operation a year ago, producing 1,826,-929 tons of a capacity of 3,660,000 tons of pig iron during the year. Out of five steel works in the state, three were active last year, producing, in conjunction with the one in Georgia, 572,073 tons of steel ingots and castings out of a capacity of 1,055,000 tons. With seven out of nine rolling mills active, Alabama produced 413,654 tons of rolled iron and steel. It is significant that of the total of 5,328,011 tons of iron ore produced during the year, this state was responsible for 4,838,959, while its coal production was 15,993,422 tons and its output of coke, 3,084,149.

Kentucky and Tennessee are well represented in the production statistics of the iron and steel industry. Kentucky has six blast furnaces, five being in operation a year ago, producing 236,393 tons of pig, as compared with a total annual capacity of 314,250 tons. Two steel works in each of the two states show an output of 164,009 tons of steel ingots and castings, their total capacity being 386,000 tons. Six of the seven rolling mills in Kentucky were active a year ago, their output, combined with that of North Carolina's mills, totaling 151,422 tons. The coal industry of Kentucky is larger than in any of the other five states mentioned, producing 20,382,763 tons annually, the output of all six being 44,-809,714. The iron ore production of Kentucky, combined with that of West Virginia, Maryland and North Carolina, was 91,966 tons during 1914, while the coke output for Kentucky alone was 443,959 tons.

Tennessee had fourteen of eighteen blast furnaces working at the beginning of 1915, the production for the previous twelve months being 216,738 tons of pig, compared with an annual capacity of 781,650 tons. Tennessee's production of iron ore for the year was 330,214 tons, while 264,127 tons of coke and the 5,943,258 tons of coal give an inkling of the magnitude of other branches of the iron and steel trade in this state.

Georgia has four blast furnaces with an annual capacity of 129,500 tons of pig iron, although none were in operation at the end of 1914. Its steel works, however, produced a good share of the total of 572,073 tons of steel ingots and castings given for Alabama and Georgia. Its capacity is 60,000 tons a year. Georgia's two rolling mills, combined with one each in Tennessee and Texas, produced 61,229 tons of rolled iron and steel for the year. Iron ore to the extent of 67,772 tons, with 24,517 tons of coke and the 166,498 tons of coal mined in Georgia and North Carolina were other products for 1914.

Louisiana and Texas do not contribute quite as largely as the other states mentioned to the iron and steel industry of the country, but their steel works, rolling mills and the 2,323,773 tons of coal produced by Texas are worthy of attention. These states have two steel works each, their combined capacity being 2,225 tons of steel ingots and castings, of which 955 tons were produced in 1914. Texas also has one rolling mill, its output being included in the 61,229 tons of rolled products credited to the three states, Georgia, Tennessee and Texas.

Enthusiasm Rampant at Louisville Show

Indications Point to Splendid Season

LOUISVILLE, Ky., Feb. 26—Optimism is in evidence everywhere at the ninth annual exhibition of the Louisville Automobile Dealers' Association, which opened last Monday evening and closes tonight. Indications point to a splendid season following the show. It is the largest motor exposition to hold attention south of the Ohio river, and, as usual, is staged in the First Regiment Armory, which covers 54,-000 square feet of floor space. The big military building is one of the leading show places of its kind in the country, there being no pillars to obstruct the view.

Forty-three exhibitors, showing forty-one different makes of gasoline pleasure cars are twenty-eight more than last year, four electrics and nine commercial vehicles. The Old Hickory truck, built by the Kentucky Wagon Mfg. Co., a local concern, and the Dixie pleasure car, made by the Dixie Motor Car Co., at the plant of the Kentucky Wagon Mfg. Co., are displayed for the first time at a show this season.

Factory representatives from all of the big motor centers are in attendance. Hundreds of dealers from all parts of Kentucky and southern Indiana also are daily visitors at the show. While the local exhibition, in the main, is a retail proposition, the Louisville distributors and factory representatives have closed many new contracts with sub-agents and dealers for the coming year.

One of the features of the Louisville show is the great interest being manifested in the commercial vehicle by Kentucky merchants and manufacturers who are buying more trucks than ever before.

Business is much better than it was at this time last year. A conservative estimate, based on interviews with dealers, points to an increase of about 30 per cent so far this year over the same period in 1915.

Louisville's show is the greatest motor event of the year in Kentucky and marks the opening of the selling season in this section of the country. The district embraced by the local agents, factory representatives and branches, as a rule, covers Southern Indiana, the entire state of Kentucky, and in some instances Tennessee, western West Virginia and Virginia.

New England Is a Multi-Million-Dollar Market

European War Orders Cause Increased Demand for Cars Products and Prospects of the Territory

By James T. Sullivan

MILLIONS of dollars have been flowing into New England the past year. Prosperity has been spreading its magic wand over all the country and the section of which Boston is the hub has been gathering its share. So there is no reason why the motor car dealers—if they use good judgment and common sense business methods—should not reap a harvest. When 1916 ends it should find that instead of one motor car to about every 34 people there, the ratio should show one to a figure in the 20's.

To get statistics one has to go through census reports, and some of them go back 5 years, but that is not a long time in the present mode of living where the motor vehicle has speeded up everything. Beginning with population and areas, for the people and their domain are the principal figures upon which to base facts, it is found that in the last or 1910 census, New England had 6,552,681 people, who had 61,976 square miles of land.

Now as the population gained more than 900,000 in the 10 years before the census, it is a fair estimate to say that in the last 5 years there has been added some 500,000 to New England so the present day figures would show that there are close to 7,000,000 people here. It is divided into agricultural and manufacturing sections. There were 188,802 farms with a total value of $867,240,457 in the six states when the last figures were compiled. Now, of the farms, 168,408 were owned outright by the occupants working upon them, and the average value of each farm was $4,593. Out of the total, there were 109,586 free from mortgage. As an evidence of thrift during the 10 years preceding 1910, there were mortgages placed upon only 2,693 farms or an average of 269 a year. And during that period, the increase in the value of farm property jumped $227,594,557.

Therefore, if New England produced more than $140,000,000 worth of farm products a few years ago, the figures must have increased in the last few years, and among the thousands of owners of these productive farms, there are many who have not yet taken to motoring. That is one fertile field where sales may be made.

Let us take up some of the industrial and manufacturing figures. In the last census for New England, was shown that the section was thriving for the value of its products had reached $16,078,505,000. And there were in New England 25,351 establishments, each one of which reported that it produced more than $1,000,000 worth of goods an-

nually. There total was $1,241,888,287. The following table gives both the total value of products, also the number of establishments, and the totals of those that showed more than the million value:

STATE.	Tot. products.	No. est.	Value above million.
Maine ...$	176,029,000	3,546	$ 57,250,905
N. Hamp.	164,581,000	1,961	80,784,016
Vermont..	61,989,000	1,958	7,195,281
Massa'ts..	14,905,290,000	11,684	719,811,362
Rhode Id.	280,344,000	1,951	135,285,205
Connec'ut.	490,272,000	4,251	241,562,058
Totals...	$16,078,505,000	25,315	$1,241,888,827

One of the best evidences to show how New England products have jumped in value one has only to compare the table showing the value of all the establishments in the six states of a few years ago to the one showing the industries in Massachusetts alone that did a business of at least $5,000,000. In other words 45 industries in the Bay State, each of which did a business above the sum quoted, showed a total in 1912, only 3 years after the census, of $1,454,944,215, or above $200,000,000 more than the total of the entire New England firms allowed to be quoted at the $1,000,000 mark.

War Profits Great

As everyone knows, the war has been responsible for dumping a lot of money into New England. But a lot of the firms will not say a word about such contracts because they fear labor troubles, and assaults upon their property. Not until the state officials get busy and take a census will it be possible to get some accurate figures. However, it is known that various lines have benefited. There is no question about the awarding of contracts to the Burgess people at Marblehead for aeroplanes. It was estimated to be worth about $1,000,000, at the lowest, for a contract of about $12,000,000 was sent here to the Curtiss company, and part of it went to Burgess. He will get more of it. Then the plant of Ex-Governor Foss, at Hyde Park, got orders for aeroplane motors from abroad and here. Each motor sells at $3,500.

Boots and shoes were a big factor. New England leads all other sections of the United States in this product. It produces 57 per cent of the entire output of the boots, shoes, slippers, cut-stock, findings, etc., and a large percentage of the leather made in this country. There are 1,000 shoe factories and cutstock and findings establishments, the greater part in Massachusetts, New Hampshire and Maine, whose product is sold the world over. In these industries $111,000,000 is invested from which $300,000,000 worth of goods are turned out by 100,000 wage earners, annually.

Massachusetts is the leader. Of the total, about 875 of the boot, shoe and findings factories are in the Bay State, having 83,000 workers, with more than $90,000,000 capital and a product of $236,000,000. The work is carried on in 63 cities and towns.

Naturally Boston is the center of activity as a result. It is the world's chief mart of the hide, leather, boot, shoe and kindred trades, and the leading financial distributing and style center of the American footwear industry. There are more than 1,000 concerns represented in the trades, including 500 boot and shoe, wholesalers and retailers, with 350 hide, skin, leather, machinery, etc., firms. One whole section of the city is given over to the industry. Hundreds of buyers from the United States and abroad visit the district annually, and more than 3,000,000,000 pairs of shoes have been shipped from the city alone in the past 45 years.

Clothing was one of the big items for war orders. Firms in different parts of New England who were not afraid to say they had received contracts for blankets, clothings, etc., totaled $6,350,000. But there were a lot of others who refused to say anything about their orders, particularly the makers of woolen goods. Blanket orders were placed by the Allies early in the war running into some $20,000,000, and New England woolen mills got a generous slice of that, more than half.

The demand for chemicals resulted in some firms in Massachusetts getting orders, one of them being forced to operate day and night. No one will ever know how the money was spent for dyestuffs.

Electric machinery has been in demand, and as a matter of fact machinery of every description, particularly such things as lathes. The General Electric Co. at Lynn and Pittsfield has been doing an enormous business since the war started. The machinery production at Lynn last year, including the General Electric business, reached between $30,000,000 and $35,000,000.

Munitions have been the big factor of all, however. Springfield looms up in the limelight of munitions. The Westinghouse Electric and the Bethlehem Steel Co. both bought places there, among the factories secured being the Stevens Duryea. It was said that the Westinghouse people had an order for 1,000,000 rifles to cost $27,000,000. Anyway it put 3,500 men to work. A Lynn man got a $16,000,000 shrapnel order from Russia. A Boston gear company got such a big order that it bought a big plant at Portsmouth to run as an auxiliary to its Boston one. The order was estimated at $5,000,000 with a possibility of enlarging it. The United States Cartridge Co. that employed 500 hands in 1914 now has 7,100 and it runs day and night.

Employes have shared in the general prosperity. This is a fact that should be impressed upon dealers of small cars. The higher wages will allow many men now to own small cars. Just how much the wage increases amounted to cannot be determined. Even the Massachusetts board of labor cannot tell. But since January 1 the writer has noted in the paper increases averaging about 5 per cent for 56,550 workers in New England. But there were a lot of others who got a raise in 1915, at least as many more.

With the increase in wages the banks have plenty money. Bank Commissioner A. L. Thorndike in his report to the Massachusetts legislature said that on Nov. 1, the end of his fiscal year for reports, the fourteen national banks in the state has $236,312,748 deposited, showing a gain of about $1,000,000. The savings banks had $928,830,655 deposits, a gain of $29,541,059 over 1914.

If a brief summary is made of some of the prosperous figures in Massachusetts alone they would read about as follows:

Aeroplanes, parts	$ 8,500,000
Boots, shoes	25,000,000
Blankets	10,000,000
Clothing	25,000,000
Chemicals, dyes	5,000,000
Munitions	75,000,000
Potatoes	7,000,000
*Increased stock div.	11,816,762
Increased bank assets	136,625,706
Wage increases	250,000
Boston export increase	37,000,000
Total	$341,192,468

*One quarter only.

New England Motor Car Registrations

How the Six States Take to Motoring

REGISTRATION statistics for the calendar year 1915 indicate that the New England states are still far from the saturation point as regards their ability to assimilate motor cars and trucks. At the beginning of 1916 there were 185,363 motor vehicles in use in these six states, all duplicate registration due to non-residents' cars and re-registrations on transfers of ownership having been deducted. In other words, New England, with a population of 7,108,003, according to the estimate of the United States census bureau experts for Jan. 1, 1916, or nearly one-tenth of the total for the country, is still considerably short of having one-tenth of the total registration, although its population-to-car ratio is somewhat lower than the average for the United States, being approximately 38, as compared with 42.

Industrial statistics show that there are thirty manufacturing establishments in three of the New England states, Massachusetts, Connecticut and Rhode Island, which are producing passenger cars, commercial vehicles and motors.

Of the total registrations, 164,559 are passenger cars, the remaining 20,804 being motor trucks of various sizes and types. A marked increase in registrations over the 1914 statistics is revealed by the 1915 reports, the gain for the year being 39,331 cars and trucks, or 26.9 per cent over the previous 12 months. As compared with the first reliable statistics available, the registration reports for the year 1911, the

latest figures show a gain of well over 100 per cent, the 1911 total being only 76,488. During the 5 years 108,875 motor cars and trucks were added to the number in use in that territory.

Massachusetts still is the leader of this group of states, as it has been since the earliest days of the industry, its 1915 registration being 89,133, which is a gain of 12,301 cars and trucks, or 16 per cent, over the previous year. There are nearly 10,000 commercial motor vehicles in the Bay State which has over twice as many as its nearest rival in New England, this being Connecticut.

Accepting the latest census bureau estimate of 3,690,748 as the population of Massachusetts at the beginning of 1916, the Bay State has forty-one persons for each car and truck registered, allowing for all duplication.

Second place in the New England group goes to Connecticut, which at the end of 1915 had registered 38,950 cars and trucks, or over 20,000 more than any state in this territory with the exception of Massachusetts. The Nutmeg state's increase in registration during 1915 was 12,732 cars and trucks, or 49 per cent, being 431 more than that of Massachuetts during the same period.

In respect to the number of trucks registered Connecticut is far ahead of all the other New England states except Massachusetts, having nearly 5,000 in use.

The Nutmeg State

Crediting Connecticut with 1,234,031 population, there are thirty-two persons to each car or truck in the state, this being the lowest number being shown by any of the New England States, an honor which is shared with Vermont.

Maine ranks third of the New England states in registration, having 18,600 cars and trucks at the close of 1915, its increase of 4,300 being 269 greater than the gain of 4,031 made by Rhode Island. Thus Maine shows a 30 per cent increase in registration as compared with the 1914 total of 14,300, while on its estimated population of 770,064 for Jan. 1, 1916, it has a population-to-car ratio of 41. Of the total registration approximately 1000 are commercial vehicles.

Rhode Island registrations for 1915 were 16,362, an increase of 4031 cars and trucks or 33 per cent over the 12,331 on record at the end of 1914. On a population basis of 608,540 the smallest state in the country has thirty-seven persons to each motor vehicle. Of the total registration, over 1500 are motor trucks.

Although New Hampshire had 1242 more cars registered in 1911 than Vermont, in 1915 the latter state managed to forge to the front, its total of 11,499 cars and trucks being 680 in excess of the 10,819 which New Hampshire was able to muster. Vermont's increase over its 1914 total of 7613 was 3886, or 51 per cent, and on a population basis of 363,075 its population-to-car ratio was 32, this state sharing with Connecticut the place of honor in this respect among the New England group. Only about 350 motor trucks are in use in Vermont.

Although ranking below Vermont on the basis of car and truck registrations in 1915, New Hampshire is only 680 behind, having 10,819 motor vehicles as compared with 8738 at the close of 1914, a gain of 2,081 machines, or 24 per cent. Like Maine and Massachusetts, New Hampshire has forty-one persons for each car and truck registered, its population on Jan. 1, 1916, being estimated at 441,545. There are nearly 1,000 commercial vehicles included among the registrations.

Gossip of the Dealers' Show Circuit

Boston and New Orleans Ready for Opening

BOSTON, Mass., Feb. 28—Manager Chester Campbell of the Boston Automobile Dealers' Association took over Mechanic's building today and placed an army of several hundred workers in it preparing for the Boston show. Hotel rooms will be at a premium during the next 2 weeks. The advance guard from the factories has begun to arrive and by Saturday there will be a lot of them here. Many of the big officials are coming to Boston this year, men who have been content to go to New York and Chicago alone.

It is expected that a new record for attendance will be reached and Mr. Campbell states that it would not be surprising if the totals reached 300,000. The show opens next Saturday afternoon at 2. There will be no extra nights this year such as Society Night, with its double price, Governor's Night, Military Night, etc., as in the past. The dealers' association decided to run along on a business basis figuring that the so-called special nights drew people who were in the way instead of being good prospects.

ARGENTINE PLANS MOTOR SHOW

Washington, D. C., Feb. 25—Argentine is to have a motor car show sometime this year. It will be held at Buenos Aires under the auspices of the Argentine Touring Club, and it will last one week. In order to give the exposition the widest motor aspect possible, the touring club, which is now planning the display, contemplates an exhibit of motor boats also. To afford a wide demonstration of the motor principle, the club expects to apply it, as far as possible, to the agricultural and other industries of Argentine which are beginning to avail themselves of the motor in an industrial way.

Incidentally, the club plans to give special attention to pleasure and commercial cars, and another feature of the show will be races of cars and boats.

NEWARK SHOW A SUCCESS

Newark, N. J., Feb. 28—Newark's show ran true to 1916 form; it was the biggest and best it ever had which is the experience that every other show-city has had this year. Paid admissions were double what they were a year ago despite a protracted spell of intense cold alternated with driving rain. The interest was greater, sales were more frequent, and there was a businesslike air that was not so pronounced at previous shows.

NEW ORLEANS SHOW NEXT WEEK

New Orleans, La., Feb. 26—The greatest motor car show in the history of New Orleans is promised for March 9, to run 4 days. Special features have been provided for each day with Friday set aside as society day. The exhibits will be arranged at the Washington Artillery Hall.

The 1916 show will be conducted under the auspices of the New Orleans Automobile Dealers' Association and under the direction of Thomas C. Campbell.

SYRACUSE EXHIBITION CLOSES

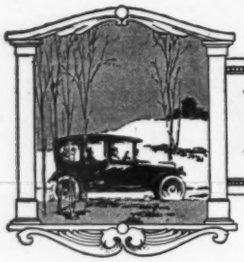
Syracuse, N. Y., Feb. 26—Some measure of the prosperity which is sweeping through central New York was revealed at the show held in this city during the week ending today. Without exception, dealers and distributers expect to exceed in 1916 their sales for 1915. Their optimism is based on the fact that during the year gone by manufacturing industries in the principal cities in this section has shown a consistent increase, that farmers are well out of debt, crops have been good, bank balances are heavy and there is promise of an early spring with early touring weather.

During 1915, the five counties which are contiguous to Syracuse, and from which Syracuse dealers draw their trade, absorbed 20,467 cars. The show was the eighth annual affair and was staged by the Syracuse Automobile Dealers' Association.

FAIL TO FORCE LIABILITY INSURANCE

Concord, Mass., Feb. 25—A bill to require all motorists in Massachusetts to take out liability insurance to the amount of at least $2,000 received scant support by the legislature. It was claimed by advocates of the measure that if insurance were compulsory a $2,000 policy would be obtainable for $5 per year. They argued that if the state is to authorize motor car operation it should provide a means for indemnifying the injured.

J. D. Sullivan, for the Boston Automobile Dealers' Association and the Commercial Vehicle Association, opposed the bill on the ground that it would work hardship on the man of small means.



EDITORIAL PERSPECTIVES

Carburetion Demands

EACH year sees more stringent performance demanded of the carbureter manufacturers. High-speed motors have brought their peculiar problems. Coupled with these have been the demands of eight and twelve-cylinder designs and on top of all come demands for greater acceleration and also better performances in starting in cold weather. These combined have constituted no mean task, but nearly all of the carbureter makers, who are in the production field, have done much to meet the new requirements so that carbureters are keeping well abreast with engineering progress of the motor car movement in general.

EACH year has its peculiar carbureter problem and for the new season rapid acceleration has been most generally called for, in short, demanded. The acceleration of a year or so ago will not suffice, it is the acceleration of 1916—a new high mark all by itself. Tests on speedways during the past year have brought acceleration more to the front and these will grow in popularity.

TO meet the acceleration demand, the carbureter maker has had to arrange to give a greater quantity of gasoline on a sudden demand. To produce the requisite acceleration, a greater percentage of gasoline to air is needed and to do this various devices have been installed. Quick acceleration demands a surplus of gasoline for but a brief period after which the normal supply will care for the motor. It may be but a matter of a few seconds, yet it is of importance that this additional supply be ready and in available form for that brief period.

TO do this the added nozzle has been introduced by some makers, so that when the suddenly-opened throttle brings the auxiliary air valve into use, the valve in turn brings more gasoline into the mixture, an added supply. One maker does this by a dashpot on the auxiliary valve stem, this dash pot performing a regular pump stroke and forcing gasoline into the mixing chamber by way of a separate nozzle as the auxiliary air valve opens. Once open the pumping action ceases but the nozzle remains open for a more even demand for more fuel.

SOME of the other makers are connecting the throttle with the needle valve in the spraying nozzle so that by a carefully computed cam action it is possible to give a sudden lift of the needle and thus give the desired fuel supply quickly. Other makers have connected the auxiliary air valve with the needle valve in the nozzle so that as the air valve opens there is a larger nozzle opening for the flow of gasoline.

ALL of these methods of providing acceleration are based on the accepted belief that in carburetion different mixtures of air and gasoline vapor are needed for different motor requirements. The days are past when the uniform-mixture argument dominated, the argument that the ideal carbureter was one that would give, say, a mixture of fifteen proportions of air to one of gasoline vapor for all speeds, acceleration, hard pulling with open throttle, and high-speed work with open throttle, etc., etc. The new rule is that the amount of gasoline fed into the air volume must be changed according to demands, and that if a twelve-to-one mixture might be best for acceleration, that a fifteen-to-one may be best for pulling with throttle wide open and a seventeen-to-one mixture for particularly highspeed work.

TODAY the problem is to give a varying mixture. The richer mixture will give the desired power for acceleration and for heavy pulling, and the leaner mixture will serve for normal running, while a still leaner mixture may prove best for the highest speed work. To do this one maker sets out with the premises: We will supply air capacity sufficient for the cubic volume of the motor and then will arrange to feed the gasoline to meet the demands of acceleration, pulling, speed, etc. This may call for a more or less complex design, but yet one that can be adjusted to varying needs and a design that has proven very popular with the American owner. To do this gasoline may be fed into the air in one, two or perhaps more points, the task being to control the flow to give the desired results. As already stated the auxiliary air valve is often called upon to do this regulating, the throttle is made do it in some designs and in others the atmospheric pressures are the force utilized. Satisfactory results are being obtained in all of the different lines.

ONE of the conspicuous carbureter trends of the 1916 season is the greater use of the side-outlet carbureter, that design which fits direct to the side of the cylinder casting, thereby eliminating the intake manifold. This design has been made possible by the very general use of the vacuum-gravity fuel feed, which allows of the carbureter being located higher than was possible with gravity feed, and higher than was customary with air pressure feed. Better carburetion is possible with the manifold eliminated, as the cored passages in the cylinder casting are equivalent to a water-jacketed manifold, condensation of the mixture being quite eliminated. The side-outlet carbureter is cheaper from a car-making standpoint; and has done much to simplify the motor and in not a few cases has added to the motor accessibility in that the valve stems, springs, etc., are not obstructed by the manifold or the carbureter.

AS to whether the carbureter without moving parts will eventually triumph over that type with moving parts, or vice versa, is still an unsolved problem. The past year has seen some new designs brought out without incorporating auxiliary air valves, springs, etc., depending solely on a weighted air valve, which carries a metering needle, or measuring needle as we call it, to control the flow of gasoline from the nozzle. It is possible that if it were not for patent litigation the carbureter without moving parts would make more rapid progress, this being particularly true with regard to the atmospheric type.

INCREASED production in cars is bound to show a change in carbureter design. The carbureter maker, who set out with high ideals of the finest construction, has had to alter his plans and is today producing a carbureter designed for rapid production. By thus keeping in step with production demands the carbureter maker has largely held his trade and the maker of great numbers of cars has not been called upon to manufacture his own carbureters. He gets the best of service from the carbureter maker and also gets the value of the engineering corps that a few of the carbureter makers maintain.

Should the Country Roads Be Illuminated to Promote Safety?

Suggests Plan Be Devised to Bring This About, State, County and Township Funds Covering Expense

THE city resident so long has become used to street lighting that he feels lost when he gets into the country where about the only lights he sees are those that shine from the windows of the farm houses. Especially this is true of the city motorist who becomes accustomed to considerable light in addition to that furnished by the lamps of his car.

Some enthusiasts are endeavoring to start a movement to the end that something be done toward lighting heavily traveled country roads in furthering safety of night driving, the expense to be borne by the townships and counties through which these roads pass, together with some aid from state funds.

The lighting of public highways other than streets in municipalities, by counties or states has been sadly neglected in all parts of the country; in fact it is doubtful if there are any highways in the United States which are illuminated at the expense of the state or county. In gathering data for the report of the committee on municipal and highway lighting, the secretary of each state in the union was consulted for information regarding highway illumination which is paid for by the state or by counties.

About 90 per cent of the states in the union were heard from to the effect that no money ever was expended for this purpose or that the subject ever had been given consideration. The rapid increase of traffic during the night, for which the motor car largely is responsible, calls for the safeguarding of public highways by illumination, and it is expected that the committee, of which Thomas F. Kelly, Dayton, O., is chairman, will incorporate in its report some ways and means for bringing about a movement for interesting state governments in safeguarding by illumination at least the principal highways of the country.

This is a broad subject but has no phases that are insurmountable, and some plan possibly could be worked out whereby the ever-increasing throng of motorists might find country driving at night almost as enjoyable as day driving.

BOY SCOUTS AS TRAFFIC COPS

Toledo, Ohio, Feb. 26—The boy scouts' organization of Toledo has enlisted its efforts in preventing and punishing violations of the traffic laws and regulations by motorists and others. The scouts have been instructed by Safety Director Newton and Secretary Kilbury of the Toledo Automobile Club on traffic rules and have been supplied with 5,000 red tags. These tags are to be used in tagging cars, where the drivers violate traffic rules and have a space for the nature of the offense. The tag contains the words "The coupon on this tag has been filed with the license number of your machine and all of the facts about the violation of the traffic ordinance have been turned over to the safety director. Second violation will mean your arrest."

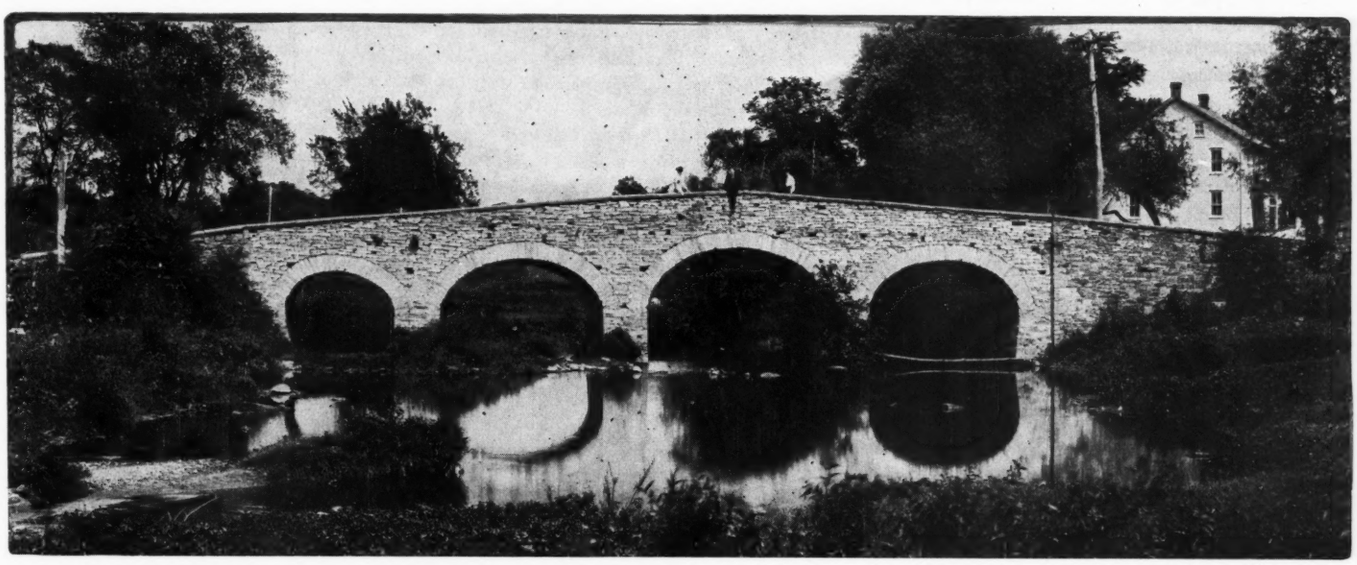
When horse-drawn vehicles are found violating the traffic rules their drivers will be notified. Motorcycle policemen have been ordered to follow the work of the boy scouts.

Steps have been taken by city officials and the officers of the Toledo Automobile Club for a "Walk Right" day on which pedestrians will be taught the best means of conserving their safety on crowded thoroughfares.

TRUCK DEALERS START SCHOOL

Los Angeles, Cal., Feb. 28.—A public school for students of commercial vehicle operation has been inaugurated by motor truck dealers of this city. All problems of motor transportation are considered.

See America First — See America Now



EDITOR'S NOTE—This is the sixty-eighth of a series of illustrations and thumb-nail sketches of the scenic and historic wonders of America to be published in Motor Age for the purpose of calling the attention of motorists to the picturesque points of interest in their own country

NO. 68—WHITMER'S BRIDGE NEAR LANCASTER, PA., ONE OF THE OLDEST IN AMERICA

WHAT is believed to be one of the oldest bridges in America is located at the gateway of Lancaster, Pa. This is known as Whitmer's bridge, and although built in 1792 and having been in constant use since that time still is in the prime of preservation. It was used by the old Conestoga wagons en route from Philadelphia to St. Louis many years ago and now is one of the connecting links of the Lincoln highway. It has never been repaired and appears to be good for several hundred years to come.

Time Payments Popular

Five Makes of Cars Are Now Sold on Deferred Payments

Other Companies Expected to Enter New Field for Sales

DETROIT, Feb. 28—The selling of motor cars on installments has now become a standard part of the business of dealers selling at least five makes of cars. Doubtless other makers will be added to the list from time to time, but the five so far in line on the proposition are the Overland, Studebaker, Chalmers, Maxwell and Paige, all large producers, and their announcements of arrangements on behalf of their dealers came out in about the order named. In every case the car maker has no financial interest in the credit company that buys the notes taken in by the dealers, but the maker has simply made the proper arrangements so that the dealer may do this class of business on a proper and logical basis.

In every case so far made public, an old and firm banking house is back of the arrangements, and while the plans differ considerably in their details, they follow about the same general idea of having one-half to one-third of the price of the car paid down and the balance in eight monthly payments. The banking firm then buys these notes from the dealer. Hence the dealer has a ready outlet for this paper and does not have to use his local credit for the purpose. Undoubtedly the installment idea will increase the sales of cars, for it opens up that field in which there are many who have enough to buy a car, but cannot pay it all out at once.

The Men Behind

Following are the credit houses back of the time sales of the five cars mentioned:

Overland—Guaranty Securities Co., Toledo, O.
Chalmers—Agricultural Credit Co., Chicago.
Studebaker — Commercial Investment Trust, New York and St. Louis.
Maxwell—American Commercial Co., Cleveland.
Paige—Bankers' Commercial Corp., New York.

Up to a short time ago it was generally thought that cars could not be marketed successfully on the installment plan basis, because it was believed there was too much risk of damage and depreciation to the vehicle between the time of first payment and final payment. However, the new arrangements seem to overcome this difficulty.

The wider use of cars by the general public and the need of an adequate method of doing such business as to save the dealer from haphazard methods that might lose him much money or even wreck his business have decided some of the big producers of cars to make arrangements with banking interests to finance such transactions. Doubtless the great earnings of the motor car makers during the past year and the constantly increasing market for cars were big factors in bringing to the attention of big banking houses the matter of financing time sales, just as these factors have induced many moneyed interests to invest heavily in the expanding motor car factories themselves.

Although the arrangements differ in details, the general scheme of these deferred payment plans is the same. Usually the dealer is required to take one-third or one-half of the list price of the car down, and the balance in eight monthly payments. The cost of insuring the car against fire, theft and transportation loss is added, as well as 6 per cent interest on the notes which the buyer gives. This is a cash sum that must be paid at the time the initial payment is made. Then the dealer indorses the notes and sends them to the banking house which buys them from him less a brokerage charge that ranges from 2 to 3 per cent in most cases. In one or two instances the banking firm sends immediately the entire amount of the notes less brokerage, and in others an amount of $100 to $200 is withheld and the dealer given a deferred certificate for this. He can cash this certificate through the banking house when the customer has paid the last note, or if he wishes he can use it immediately sending it to the car manufacturer who will accept it on the purchase of more cars, less a discount of 5 per cent.

Must Investigate Prospect

For this kind of business the plan laid down usually specifies the kind of person whom the dealer can sell in this deferred payment basis, and since he endorses the notes he is reasonably sure to satisfy himself that the party is able to pay for the car as agreed. Certain investigation procedure is given the dealer and usually all the necessary forms and notes are furnished him so that the sales are made in a strictly uniform manner and in accordance with the rules the dealer is instructed to follow. He will, of course, follow them as he wants the notes to be taken by the credit firm.

In most instances the plan does not interfere with the dealer's local banking arrangements and there are no restrictions if he wishes to finance the installment sales through his local bank he is at liberty to do so. Usually the dealer needs all of his local credit for taking in the shipments of cars as they come from the factory, and the new scheme is a method whereby the dealer can take care of a much larger volume of credit sales than he would be able to do were he entirely dependent upon his local credit.

Many will wonder why the banking firm will not remit them the entire face value of the notes less the brokerage, instead of paying all but about 10 per cent and giving a deferred certificate for that, paying it when the car is fully paid for. This is because it is held that the dealer must have some interest in the transaction after he has made the sale and taken the notes.

Materials Still High

Detroit Makers Say that There Is Little Change in the Market

Producers Must Catch up with Orders to Bring About Relief

DETROIT, Feb. 28—Manufacturers of this city who were interviewed today see very little change in the condition of the general materials market as compared with their status 2 weeks ago when a general investigation was made. Most of them express the vnew that no relief from the current high prices of all raw materials is in sight. The recent German successes and talk of an early ending of the war should Verdun fall into the hands of the Kaiser's troops would not mean any bettering of prices for some months at least, until the producers could get reasonably caught up in their orders. However, such an outcome seems so remote that few, if any, of the Detroit motor industry are taking such a long chance and are contracting now for deliveries well into 1917 at current prices. The feeling is quite general that the steel mills are taking as good care of the industry as could be expected under the existing circumstances.

In conversation with one of the largest carbureter makers, this manufacturer said that there seems to be even greater trouble in getting brass, which has heretofore been a necessity to carbureter production. However, his concern soon will be making nothing but malleable instruments, so the brass shortage will not affect him very much. This is a very interesting development of the material situation and indicates that the manufacturers are meeting conditions as they find them. There is no reason why malleable iron could not be used advantageously, but it took unprecedented conditions to force its development.

Some Are Well Stocked

Wm. T. Jones, general manager of the Edmunds & Jones Mfg. Co., large maker of lamps, whose principal requirements are brass, steel and glass, is one of those who does not see any immediate relief, although his company is in an enviable position, due to having contracted as long as 18 months ago for what materials would be needed this year. He states that the concern now has in stock five times as much material as 1 year ago, this serving to indicate the foresight displayed in many of the big factories.

As a result, current high prices are not felt, but as there does not look to be any tendency to lower prices, Mr. Jones said that they are now contracting for supplies for delivery during the second quarter of 1917. In normal times it would not be necessary to figure more than 60 days ahead, he explained, but now it is necessary to look 12 months ahead on steel.

Fuel from Uncle Sam?

Bill Empowering Government to Make Gasoline Introduced in Congress

Law Maker Would Use Rittman Process and Sell Gas at Cost

WASHINGTON, D. C., Feb. 26—Denouncing the methods employed by gasoline manufacturers in maintaining prices as "rapacious," Congressman Charles H. Randall, of Los Angeles, Cal., has introduced in the house of representatives a resolution for the government manufacture and distribution of gasoline at cost. The resolution states that the process of refining gasoline discovered by a government expert, Dr. Rittman, and supposed to reduce the production cost of the commodity 50 per cent, has had no effect in lowering the retail price.

On the other hand, Congressman Randall's resolution points out, manufacturers of gasoline have raised prices 50 per cent since the announcement of the Rittman process, despite the fact that crude materials from which gasoline is manufactured have not advanced in price. The resolution is intended to give the government power to manufacture gasoline by means of the Rittman process and also to sell it at cost to consumers.

Fuel Price Reports

In New York the price of gasoline remains at 23 cents, nearly three weeks having gone by without an increase, though there are unabated rumors of further rises. Philadelphia, usually a little below New York in gasoline prices, now has gone ahead and is paying 24 cents, and Pittsburgh has followed the example of Philadelphia and also has 24-cent gasoline.

The Standard Oil Co. has advanced the price of gasoline for export 1 cent, the figure now being 28.6 per gallon in 1,000 case lots.

In Portland, Ore., the price has risen from 17½ to 18½ cents. In Tacoma, Wash., the price has jumped from 16½ cents, which was the wholesale figure early in the month, to 18½ cents, and it is considered probable that the month will be ushered out with another cent's increase.

Rumors and declarations of intention to investigate and discover who is working the lever under the price are still plentiful. One of the latest is that Prosecutor A. M. Henderson, Youngstown, O., will make a searching investigation of the charge that there is a combination among the Youngstown dealers to fix the price.

An embargo on gasoline shipments to the war zone might help the price situation, according to the testimony of Robert Stewart, a director of the Standard Oil Co., of Indiana, given before the fire committee council in Minneapolis. The council had demanded that the increased price be explained before a permit was issued to the S. O. company to establish several new filling stations. Stewart further said that the price will continue to rise and that a world-wide gasoline famine is a possibility. He follows the custom of the time and blames the increased cost of crude.

A strictly seasonable report is to the effect that a chemist, Morton de Waltoff, has discovered a process for making gasoline from some undivulged substance of which the country is said to possess an inexhaustible store, at a cost of ½ cent a gallon. The discovery is the by-product of an attempt—said to have been successful—to produce carbolic acid cheaply. Details have not been made public lest speculators grab the lands in which the requisite gasoline-making substances are to be found.

In Winnipeg, Canada, the price of gasoline advanced ½ cent, making the retail price 34 cents per gallon. Local dealers are paying 33½ cents wholesale for their supplies and as a consequence are considering dropping gasoline sales altogether as the expense of handling the business on such a small margin of profit is not considered worth the trouble.

Gasoline savers are in strong demand, over 500 having been disposed of during the past week.

AUTOMOBILE CLUB TESTS TANKII

New York City, Feb. 28—Results of a certified test on Tankii, a fuel preparation made by the Tankii Chemical Sales Co., Cleveland, O., have just been announced by the Automobile Club of America, under whose auspices the test was made. The report of the technical committee indicate that no increase in miles per gallon resulted from its use. The test was made on the roads in Central park, the car first being run with gasoline and then with the mixed fuel, the Tankii being in the form of white tablets with an odor strongly suggestive of moth balls. One tablet was added to each gallon of fuel.

Three runs were made in all, first with ordinary 60.6 Beaume gasoline, then with the mixed fuel and a very lean adjustment on the carbureter and a final run with the same adjustment and plain gasoline. The mileages attained were respectively, 7.5, 13.1 and 13.4. Both the second and third runs were on mixtures which were too lean, back firing into the carbureter being frequent.

AMERICAN CAR FOR SPANISH KING

Toledo, Ohio, Feb. 29—His Royal Majesty, King Alphonso, of Spain has placed his order, through the Spanish ambassador in Washington for a Willys-Knight car. On account of the embargo on rubber tires, special permission was obtained from the British ambassador to ship this car with tires.

Facing Gasoline Crisis

Expert Says Production Has Reached Its Height and Soon Will Decline

New Processes of Manufacture Will Relieve Stringent Condition

WASHINGTON, D. C., Feb. 26—In a lecture this week Dr. David T. Day, of the bureau of mines, gave it as his opinion that oil production has reached its height and will now decline. He said that the reason why the oil-producing industry has always been so fascinating to speculators is that the oil, when found, belongs, as a wild animal does, to the man who catches it. Various courts have now decided, according to Dr. Day, that no matter who owns the land, the oil in it belongs to any one who gets it out—without trespassing.

"Oil, moreover, is a migratory mineral, that changes from one location to another according to favorable conditions," said Dr. Day. "With the solid minerals the case is different. A man owns all of the coal under his own land and for another man to tunnel under and take it is robbery, but to pump away his oil is legal. On this distinction the whole oil industry is based.

"As a result, the oil men simply produce all the oil they can, whether it is wanted or not. A few years ago we were producing thirty to forty millions of barrels of oil a year, and this was sufficient for the chief use was for distilling out the kerosene, with little thought to the 12 per cent of gasoline in it. Four million barrels of gasoline was all there was to be had.

Doubling Proportion of Gasoline

"By a strange coincidence, just at the time when motor cars and motor boats began to use great quantities of gasoline the new oil fields of Illinois and Oklahoma were developed, and we are now producing nearly 300,000,000 barrels a year. More than that, by careful refining we are getting twice as much gasoline per barrel of crude oil as we used to. With all that increase, motor cars, motor boats and other uses increase still faster and there is now not enough gasoline to go around. Further, I think oil production has reached its height and will decline.

"Fortunately, 'cracking' processes can be used for furnishing plenty of gasoline. We use only a fifth of each barrel of crude oil for gasoline. That's all the gasoline there is in it, but the remaining four-fifths can be 'cracked' up largely into gasoline. Such a process, invented by Burton, is now adding 5,000,000 more barrels of gasoline a year, and the Rittman process, developed by the bureau of mines, will add as much more as we will need."

Two Bidders for Historic Trophies

Elgin and Corona Seek Vanderbilt Cup and Grand Prize for 1916 Races

CHICAGO, Feb. 29—Ladies and gentlemen: In this corner, the Elgin Road Racing Association. In the other corner, the Santa Monica Chamber of Commerce. They will battle to a finish for the Vanderbilt cup and grand prize sanctions. Time!

The battle royal for the honor of promoting the Vanderbilt cup and grand prize road races for 1916 is on. At the annual meeting of the Elgin association, held last week, the directors and stockholders voted to apply for the sanctions for the two classics and directed Joseph Callender, a member of the contest board of the Chicago Automobile Club, to open negotiations immediately with the Motor Cups Holding Corp., which controls the two trophies.

Santa Monica already is in the market for the two blue ribbon events.

According to the plans of the Elgin promoters, the watch city meet will be of 8 days duration this year with 4 days of racing. The speed carnival will open Saturday, August 12, with the Vanderbilt cup, and close the following Saturday, August 19, with the grand prize. The C. A. C. cup event will be run on Tuesday, August 15, and the Elgin National trophy contest on Thursday, August 17.

At the annual meeting, which was one of the most enthusiastic sessions ever held by the association, no decision was reached regarding the distance of the four events or the piston displacement limit to be placed on the entries. These are matters that fall under the jurisdiction of the contest board of the Chicago Automobile Club.

The Elgin promoters have agreed to raise $10,000 of the $24,000 to be offered in purses by the sale of 1,000 season tickets at $10 apiece. Chicago race enthusiasts also have promised to sell the same number of tickets in advance.

The Elgin course has weathered the ravages of winter in splendid shape and very little work will have to be done on the roads to put them in condition for fast driving.

BOARD OF RACE EXPERTS NAMED

Chicago, Feb. 28—W. O. Duntley, recently elected president of the Chicago Automobile Club, has appointed the following members to serve on the contest board, which will direct the promotion of the Elgin road races, the Chicago speedway events and the annual interclub reliability matches during 1916:

George Ballou, chairman; Joseph Callendar, Tom Hay, A. M. Robbins and E. C. Patterson. This committee will have as its advisors David Beecroft, editor of Motor Age and Automobile, and C. G. Sinsabaugh.

The new contest board promises to be a very active and efficient committee. Chairman Ballou served in the same capacity last year and the other members are experienced in racing matters. Callendar was head of the C. A. C. contest board in 1914, Hay has been starter of the Indianapolis international sweepstakes for the past 3 years, Robbins at one time was a driver on the Abbott-Detroit team and Patterson is the backer of Ralph de Palma.

The C. A. C. contest board has a most strenuous season abead as it will be in charge of the Elgin road races, the three meets to be held on the speedway and at least three reliability runs.

AMATEURS WARM UP SPEEDWAY

Chicago, Feb. 28.—Practice on the Chicago speedway for the amateur drivers' race, which is scheduled for May 20, commenced yesterday when, in spite of piercing winter winds, five amateur drivers from the Chicago Automobile Club put their cars through warming up paces. No official timing was attempted but as clocked by the rail birds, none of the cars failed to do better than 66 miles an hour. One of them made laps at the rate of 75 miles an hour. Trials are to be held every Sunday, and any amateur affiliated with any officially recognized club in Chicago, will be permitted to compete in these practice contests.

DE PALMA BECOMES MANUFACTURER

Detroit, Feb. 28—Ralph de Palma is one of the incorporators of the de Palma Mfg. Co., which has been organized here with a capital stock of $100,000. The others interested with the famous race driver are Frank P. Book and J. B. Book, Jr., wealthy Detroiters. While the incorporation papers state that the new company will build aeroplane engines as well as racing cars, the main purpose at the present time is to campaign de Palma's Mercedes which gave such a good account of itself last year. The de Palma company will enter the Mercedes in the big race meets of the year, according to present plans, and Ralph is now busily rebuilding it at the present time here.

The officers of the de Palma company are F. P. Book, president; Ralph de Palma, vice-president and general manager, and H. V. Book.

Although H. V. Book does not appear in the incorporation papers, he will be the secretary and treasurer when he becomes of legal age 2 months hence. J. B. Book, Jr., owing to the fact that his brother is not yet of legal age is therefore the third incorporator, although he will have no active interest in the company. All the stock of the concern is subscribed for, and there is none for sale, the incorporators wishing this to be made clear in view of the fact that they have already been approached by parties wishing to become interested.

Another Mercedes may be constructed in addition to the one being rebuilt. De Palma says he has enough parts and could use the other car as an extra.

ASCOT PARK RACE POSTPONED

Los Angeles, Cal., Feb. 27.—The 100-mile inaugural race, scheduled to be run this afternoon at the reconstructed Ascot Park speedway, was postponed yesterday by the promoters until March 5 because of a rain that prevented the completion of minor work on the track which was required by the A. A. A. contest board before it will accept an application for license and assign a sanction number. Unofficial practice was held Friday morning but a storm that afternoon and another yesterday made the promotion of the race impossible.

THOMAS TO DRIVE FOR SPEEDWAY

Indianapolis, Ind., Feb. 29—Rene Thomas, the winner of the 1914 Indianapolis 500-mile race, who is planning another American invasion this year, will be at the wheel of one of the Peugeot cars purchased by the owner of the local speedway last summer and will not bring a mount from France with him, as was first announced.

Thomas is scheduled to sail from Europe March 25 and will land in New York April 1. He will come to Indianapolis immediately to tune up his car for a strenuous campaign. His contract with the local race promoters calls for his competition in all the speedway events on the 1916 schedule and he will remain in America until December 1 at least.

The Frenchman's car has been overhauled since last season by Johnny Aitken, who probably will be Thomas' teammate. This arrangement leaves Howdy Wilcox, who drove one of the Peugeots last season, without a mount, but he probably will be switched over to the Maxwell or the Premier Special team, captained by Eddie Rickenbacher and Bob Burman, respectively.

Johnny Aitken and Tom Rooney, Gil Anderson's former mechanician, are now working on the Premier Specials in the shops of the Mais Truck Co.

EARLY DATE FOR KANSAS CITY

Kansas City, Mo., Feb. 29—The first speedway race of the season in the middle west may he held on the Kansas City 2-mile track, now being constructed under the direction of Jack Prince, as the promotors are contemplating the promotion of the inaugural race on April 29. They will be forced to take such an early date because of the fact that the A. A. A. schedule for May and the summer months already is full.

The Kansas City speedway will be completed within another 6 weeks, according to Bill Pickens who is associated with Prince in the project. Workmen now are putting in the foundations for the track and carpenters will be on the job soon spiking down the two-by-fours.

The track is of the triple radius type and the maximum pitch of the curves is 30 degrees.

INSURANCE FOR GOODYEAR FORCE

Akron, O., Feb. 25—The Goodyear Tire & Rubber Co. has made the first distribution of life insurance policies to the value of more than $2,000,000. The company believes that life insurance is one of the best means of providing for the future, and that the mental security enjoyed by men, protected from want in case of sickness or accident, who know that their families are insured against want, in case of the bread-winner's death, renders them more efficient and permanent.

The plan selected provides for all employes. Policies for $1,000 have just been issued to all the male employes who are members of the Goodyear Relief Association, in good standing, and policies for $500 to the female employes. All women on the payroll of the company by virtue of that fact are insured without membership in the relief association.

TO TAKE OVER WOLVERINE

Findlay, Ohio, Feb. 27—The Ogontz Motor Co., of Sandusky, will be incorporated this week, with a capital stock of $25,000. R. H. Collins and V. C. Hibbard, Detroit automobile men, will be among the incorporators. The holdings of the Wolverine Motor Company are to be taken over and a plant started at Sandusky.

KNOBLOCK JOINS COLE

Indianapolis, Feb. 28—A. F. Knoblock, formerly general manager Northway Motor and Mfg. Co., has joined the forces of the Cole Motor Car Co., as general manager of that concern.

TO EXCHANGE STARTING BATTERIES

Indianapolis, Ind., Feb. 26—The Union Motor Device Co., Indianapolis, has been organized to furnish the Permalite system of battery exchanges. The purchaser of a storage battery for starting, lighting and ignition, is provided with exchange privileges, conducted in the same manner as gas tank exchanges. It is the intention of the company to arrange for exchange stations in the cities and principal towns throughout the United States where the battery purchaser can exchange a discharged battery for a fully charged one, on payment of a small fee, and provision is made whereby this service is continued indefinitely, the purchaser paying the initial fee but once, after which, under certain conditions, he is kept supplied with a battery in good condition, by a system of exchanges.

Studebaker Sales Gain 30 Per Cent

War Orders for 1915 Total $13,000,000, According to Annual Report

SOUTH BEND, Ind., Feb. 28—The Studebaker corporation has just given out its fifth annual report of the corporation, for the year ending Dec. 31, 1915.

According to the report the corporation has made a net gain in sales for the year of $13,094,782.82 or 30.1 per cent. The total net sales amounted to $56,539,006.23 for 1915 as compared with $43,444,223.41 during the year 1914. The total net profits for the year after reserving an increased amount for depreciation and after payment of interest were $9,067,425.28, as compared with $4,844,663.73 in 1914, a gain of $4,222,761.55 or 87.2 per cent. Deducting the payment of the 7 per cent dividends on preferred stock, the net profits remaining for the common stock amounted to 29.5 per cent during 1915 as against 14.2 per cent in 1914 based on a total of $27,931,600 common stock which was outstanding during all of 1914 and for eleven months of 1915.

The corporation received during 1915 $13,000,000 from war orders and $2,000,000 from the same source during 1914. In 1911 the company sold only 22,555 cars whereas last year 46,845 cars were sold, over 90 per cent of which were delivered to regular customers in the United States and the remainder to regular customers in export markets, except about 1,300 cars which were sold to foreign governments for hospital and other purposes.

One account of the reductions made in prices of Studebaker cars last summer, the increase in the volume of sales over 1914 was only 17.5 per cent, but in the number of cars turned out the increase was 32.1 per cent. It is pointed out in the report that these price reductions were made in conformity with the policy of the company of keeping a fixed profit and giving the public the benefit of all savings effected above this profit, and that while the prices were reduced the quality and size of the Studebaker cars had actually been increased.

HUPP MAKES RECORD

Detroit, Feb. 24—With an output of 101 cars on Feb. 17, the Hupp Motor Car Co. established a new winter season record. The plants here and in Jackson are being operated to full capacity yet there are over 700 orders for immediate delivery behind the schedule.

L. P. C. PARTS SOLD

Racine, Wis., Feb. 28—The American Motors Co., Indianapolis, Ind., bid in the service and good will of the L. P. C. Motor Co., Racine, Wis., at the auction sale of the Racine company's assets ordered by the assignee, F. Lee Norton. It was the first parcel offered for sale and brought $3,400. The parcel consists of all correspondence, incoming mail, catalogues, blue prints, plans, charts, cuts, printed matter and a considerable stock of parts for repairs and replacements. The American Motors Co. therefore will act as service house for all owners of L. P. C. cars in the future and will be in exclusive possession of repair parts. The company is moving the stock to Indianapolis.

Four 1916 models L. P. C. cars were sold to individuals, two bringing $700 and two $675. Four used cars brought from $375 to $400. The stock inventoried at more than $100,000.

WARNER GEAR NOT IN MERGER

Muncie, Ind., Feb. 25—R. P. Johnson, general manager Warner Gear Co., is authority for the statement that the Warner Gear Co. is in no way concerned in the merger which was reported to be undergoing formation among Indiana concerns.

PENNA. RUBBER HAS BIG BUSINESS

Conshohocken, Pa., Feb. 25—The stockholders of the Pennsylvania Rubber Co., at the annual meeting reported for the season of 1915, approximately a $4,000,000 business. Additions will be made to the factory facilities to take care of a production of not less than 2,000 casings a day.

SCRIPPS-BOOTH TO TREBLE OUTPUT

Detroit, Feb. 28—The capital stock of the Scripps-Booth Co., has been increased from $350,000 to $1,000,000 and the company is now a Delaware corporation. Of the new capital, $750,000 has been subscribed and paid in and the balance of $250,000 is being held for future requirements.

Changes among the officials have taken place. Clarence H. Booth, who was vice-president and sales director, has been made president of the company; William E. Scripps, vice-president; F. J. Sensenbrenner, treasurer, and James S. Booth, secretary. The production of the company is to be trebled. The plant is to be greatly enlarged but details as to the new buildings are not yet available.

CHANDLER PROFITS $933,217

New York, Feb. 24—The Chandler Motor Car Co., the old company, reports to the New York Stock Exchange for the year ended December 31, 1915, net profits of $933,217 as against $321,821 in 1914, and $42,232 in 1913. The new company up to January 1, 1916, had $1,513,515 cash in the bank and on hand and a surplus of $173,450.

Motor Cars and Preparedness Theme of Truck Club

NEW YORK, Feb. 25—At a meeting of the Motor Truck Club of America last week, eminent speakers on preparedness and motor warfare addressed the assembled truck users with such effect that a committee was formed to organize a larger committee to organize a motor truck reserve corps. More than this, one member of the club, George H. Pride, who operates a large fleet of heavy trucks in difficult construction work all over the country, volunteered to organize and head a truck company of his own.

The speakers were S. Stanwood Menken, president of the National Security League; Maj. Allan L. Reagan, inspector-general, National Guard of New York; Capt. T. H. Shanton, Quartermaster Corps, N. G. N. Y.; Capt. Kenneth Gardner, Seventh Infantry, N. G. N. Y., and George H. Pride, a haulage contractor of New York City and a director of the club. Mr. Menken spoke at length on preparedness, and the importance of motor trucks in relation thereto.

Motor vehicles, stated the speaker, saved Paris and in so doing, no doubt changed the history of France if not of the world. Mr. Menken was in Paris at the time of mobilization. The rapidity and thoroughness of the assembling of all manner of motor vehicles was exemplified by the fact that only with great difficulty and at a high price was he able to secure two touring cars to transport himself and party to Boulogne, for which he was obliged to pay $320.

Motor Cars Saved Paris

Quick mobilization and great mobility of forces, Mr. Menken stated were the two factors which made it possible for France to meet the enemy on the Marne and to save Paris. It was the ability to move men and their equipment far more quickly than would be possible by any other means, to positions of greatest strategic importance by the extensive use of motor busses, motor trucks and motor cars which gave the French forces the power to resist the advance of the Germans.

With a coast-line of 21,000 miles, the United States, Mr. Menken declared, has far more need of motors than France. Our coast defenses are located only at the great harbors, while the greater part of our coast line is wholly unprotected against the landing of an army of invasion. With a mobile force of less than 50,000 men available, facilities for the rapid disposition of these forces to whatever point along either coast or on either frontier which might be selected by an enemy for entry are essential to use of even such forces as we have.

Mr. Menken quoted Major-General Leonard Wood to the effect that 40,000 troops landed on Long Island could capture New York City today. Preparedness was urged by the speaker as the remedy for this defenselessness. Such preparedness he exemplified in the case of the three extra suspender buttons on the trousers of every German soldier, thus permitting adjustment of the suspenders so as not to tire the shoulders and also providing against the emergency of the loss of a button. He also cited German forethought and efficiency in the case of certain types of passenger cars which the government had required should be fitted with certain attachments to the frame whose purpose was not disclosed until the war. Then, all of this type of car were immediately seized by the military, their bodies removed and steel plates, already made and securely stored, were attached to the mysterious fitments already applied to their frames, thus constituting armored cars.

New York Patriot Volunteers to Recruit Troop at Own Expense

For Mobilizing Resources

The sort of preparedness thought desirable by Mr. Menken he divided into two portions, human preparedness and industrial preparedness. He indorsed the scheme of Martin J. Gillen, of the Mitchell Wagon Co., Racine, Wis., for industrial preparedness. This plan consists principally of a method of mobilizing the resources of the country for the production of military supplies by registering manufactories, cataloging their equipment and products, standardizing war material and munitions, deputizing executives for the superintendence of production of such material and developing plants, skilled labor and machinery for rapid production. Appropriations for the purpose of letting small contracts yearly for standard supplies among a large number of producers, are also contemplated in the plan to develop facilities.

Major Reagan spoke at length on the possibility of developing the national guard as an effective reserve weapon the federal army, pointing out that the constitution gave the war department and the president large powers in the prescribing of training and equipment needed.

Major Reagan suggested that all trucks available for military service in New York state be enrolled by the club and then divided into companies of twenty-eight trucks each, to comprise twenty-seven supply trucks and one repair truck. He stated that applications or enrollments would be received at the headquarters of the national guard.

He also stated that the National Guard of New York was working up a permanent truck company with trucks owned by the state, which might well serve as a model for volunteer companies. He stated that the volunteer companies would not be called upon for riot or strike duty, in all likelihood, as the permanent company would suffice for anything short of actual warfare. In that case, however, the auxiliary service of volunteer companies of motor trucks would be invaluable for use in connection with additional volunteer troops that would be mobilized.

Captain Shanton declared that nothing is so needed by an army as sustenance, for an army travels on its belly just as much today as in the days of the Little Corporal, yet the United States army uses but eighty-eight trucks, nineteen of which are in the Philippines. It has but three motor ambulances. He spoke in high terms of the success of the trucks now in use at the Texas border.

A truck company, as at present outlined follows very closely the lines of a mule company, consisting of the following:

MEN—

Three Ass't truckmasters	commissioned officers
One truckmaster	commissioned officers, or sergeants of the first class
Twenty-eight drivers	sergeants
One machinist	sergeant
One helper	privates
One trumpeter	privates
One cook	privates
Five motorcycle raiders	corporals

MACHINES—

Twenty-seven trucks.
One repair truck.
Five motorcycles for corporals, messengers.

Captain Shanton explained that the drivers must be selected with great care, as the work is not easy nor devoid of danger. In recognition of superior ability, therefore, these men are given the rank of sergeant. Captain Shanton also advised that in addition to the above there should be three auxiliaries, one a tank truck for oils and grease; another a truck for parts and supplies; and a third, a shop truck.

The life of a horse, he asserted, according to reports from Europe is about 10 days.

Roads Make Difference

Owing to the difference in our roads, said the speaker, American armies would not be able to use trucks in the same manner as the Germans do. It is not likely that any operations on this continent would be carried out on the main highways. For narrow, bottomless roads as found in the rural districts in which the fighting would be done, stated the speaker, horses or mules would still have to be used.

Trucks would be used, he explained, from the base of supplies to the distributing points, horses being used from thence to the camps and trenches. So used, motor trucks would revolutionize United States army work.

Standardization is essential, in the opinion of the captain, his experience as officer in charge of the transportation in the New York Police Department, which uses a number of motor patrols and several touring cars being that a variegated fleet is far less desirable than one, all of one make and model.

Practically applied, this idea would be

carried out by having each company made up of one make of vehicle.

Ten times the tonnage is being transported by motor trucks in the European war, as by horse wagons, stated Captain Gardner. In the warring countries, on January 1, 1915, 600,000 passenger cars and 55,000 trucks were being used. At that time we had 65,000 trucks and 1,900,000 passenger cars.

Mr. Pride was outspoken in his disagreement with the accepted belief that only light vehicles are practicable for American military service. He stated that the Fernch roads had been literally cut to pieces by the heavy traffic in the early months of the war, and if there is any difference in the condition of the roads in northern France and our own country, the advantage is with American highways.

The surprise of the evening was sprung when Mr. Pride closed his remarks with the announcement that he would organize a motor truck company of his own, comprising eighteen trucks and a corps of drivers, all from his own organization, together with an officers' car. He stated that his trucks and his drivers were a unit, and that the trucks' value would be cut 50 per cent if strange drivers were used. He appealed to the national guard to supply the miscellaneous petty officers and the motorcycles for the corporals. Mr. Pride insisted that his offer was contingent upon his having full power to work out his company along his own lines, being required to practice only on Sundays or holidays.

PENNSY MOTORS CO. FORMED

Detroit, Feb. 26—E. T. Birdsall, former chairman of the Detroit Section of the Society of Automobile Engineers, is the engineer for the newly-formed Pennsy Motors Co., which is incorporated for $500,000 under Delaware law and registered in Pennsylvania. The new concern is to assemble cars in Pittsburgh and has secured a plant at Pennsylvania avenue near Allegheny avenue, in that city.

The first models of the Pennsy cars are being made here under Mr. Birdsall's supervision. The plans call for a five-passenger touring car and three-passenger roadster, both to sell at $855. The motor is a Lycoming product, 3½ by 5, block-cast with head detachable and gearset in unit with it. Other specifications include wheelbase of 114 inches, Dyneto starting and lighting, battery ignition, Master carbureter, Walker-Weiss axles, and drive through the springs. Tires are 32 by 4.

Officers of the new company are: E. E. Gregg, president and general manager; W. H. Latshaw, vice-president; J. T. Horner, secretary and treasury; S. H. Handy, sales manager; J. K. Fawcett, purchasing agent; and Guy Sintz, superintendent. Three hundred cars will be built in the first lot, and Mr. Handy states that about one-third of these are already sold.

Re-Opens Kardo Suit

Patent Litigation on Axle Design Renewed by Decision

Ohio Justice Holts that the Company Is Legal

CLEVELAND, Ohio, Feb. 28—The decision of Judge J. H. Clarke, of the federal district court of Ohio, in dismissing on April 13, 1915, the patent infringement suit brought by the Kardo Co. against Henry J. Adams, dealing as the Reo Motor Sales Co., in Cleveland, has been reversed by Judge Hollister sitting in the federal court of appeals. Judge Hollister held that the Kardo Co. is a good corporation under the laws of Ohio and therefore has a right to bring suit for alleged patent infringement. He therefore remanded the case to the lower court for hehearing of the patent claims.

Settles Kardo Status

This decision practically reopens the case, which has been in the courts now for over a year and the higher court instructs that the lower court confine its decision to the merits of the patent in question. The Kardo company brought suit against Adams on January 29, 1915, substituting for the American Ball Bearing Co., charging infringement of patent No. 792,690, issued to A. P. Brush, of Detroit, for the use of a compensating mechanism termed a floating spider in the bevel gear of the rear axle of Reo cars. The Kardo company fell heir to the suit against the Reo representative when it took over the patents of the American Ball Bearing Co. The bill of complaint was filed June 25, 1913, and the case was transferred to Kardo October 3, 1914.

Judge Hollister's decision was in part as follows:

"Three corporations, The American Ball Bearing Co., The Packard Motor Car Co., and The Peerless Motor Car Co., were each the owners of separate patents on equipment for the rear axles of automobiles. Their patents were of such nature that apparently, as found by the trial court, they "interlaced or overlapped one another, so that, if one company gave a license under the patent which it owned, complaints of infringements and threatened suits straightway arose from one or another of the other companies."

"They thereupon, so that the ownership of all of the patents might be in one company, which, as owner, could grant licenses, thus saving uncertainty in dealing with the patents; and for the purpose of avoiding litigation between themselves, sought to organize a corporation of Ohio under the name, 'The Kardo Company,' with a capital stock of $1,000,000.

"* * * We proceed to determine the question, whether or not the Kardo company was clothed with sufficient corporate capacity to permit it to maintain against an alleged wrongdoer an action relative to a subject-matter within the jurisdiction of the court. The motives of the incorporators were legitimate; their purposes and the purposes of the three corporations for whom they were acting, were laudable, and it can not be denied that the purposes expressed in the articles of incorporation were, in all respects, lawful.

"No injury or fraud was perpetrated, or sought to be perpetrated.

"* * * So far as the conduct and purposes of the promoters, the incorporators, or the directors of the Kardo company, are concerned, evey step taken, both by intention and by results, was marked by absolute good faith. This is a vital fact.

"The conclusion is that this case is not one for the independent inquiry by a trial judge, on his own motion, and without the issues being raised by the pleadings, into the complainant's corporate capacity, or the reality of its interest, and that, if those issues are made by amendment, the defendant can not be heard to defend, on those grounds, the Kardo company's action for the infringement of its patent.

"The decree below will be reversed, at defendant's costs, and the cause remanded for further proceedings not inconsistent with this opinion."

FORMER PRESIDENT A. A. A. DEAD

Newton, Mass., Feb. 25—The funeral of Lewis R. Speare, ex-president of the A. A. A. in 1909, 1910, and president of the Massachusetts State A. A., a prominent oil man, who died at his home here last Wednesday, was held this afternoon. The A. A. A. was represented by A. G. Batchelder, of Washington, Robert T. Hooper, of Philadelphia, George C. Diehl, of Buffalo, and D. D. Mallory, of Franklin, Penn.

Lewis Robinson Speare was born at Boston, Mass., June 6, 1861. He came of Puritan stock, Colonial ancestors dating back to 1647, while others were officers in the Revolution. Mr. Speare was one of the first men in this country to take up motoring and when the Bay State A. A. was formed in 1905 Mr. Speare was chosen president and in 1909 he became president of the American Automobile Association, serving for two terms.

NO TERRITORY LIMITS FOR TEXANS

Dallas, Tex., Feb. 25—Future contracts of motor car general agents and subdealers over the state will eliminate territorial specifications and price stipulations. This it is said is the result of a conference at Austin last week with the Attorney General for Texas and Dallas car dealers.

J. W. Atwood, of the Buick company, who headed the dealers, said that the matter with the attorney general was amicably settled. Heretofore in the contracts, some of them specified the territory an agent should sell in and the price he should receive for the car. These objections were the one raised by the attorney general.

Indiana Engineers Tackle Motor Car Service Problems

F. A. Cornell Outlines System for Anticipating Complaint

How Factory Engineers Can Capitalize on Owners' Kicks

INDIANAPOLIS, Ind., Feb. 26—How the engineering department of a motor car factory can utilize the complaints which come into the service department to the best advantage in designing new models or making minor changes was explained to the Indiana section of the Society of Automobile Engineers at the Claypool hotel last night. This explanation was embodied in a paper presented by F. A. Cornell of the Perfection Spring Service Co., who for a number of years had charge of the service department of the Willys-Overland factory at Toledo, O. Although the title of the paper, "Anticipating Complaints," is the correct one, there undoubtedly would have been a large number of engineers in attendance had the author adopted some such title as "How Factory Engineers Can Capitalize on Kicks."

As it was, the service departments of the Indiana car and accessory factories were much better represented than were the engineering departments, a regrettable feature, inasmuch as both the paper and the lively discussions thereon were full of suggestions and inspirations for the prompt betterment of factory production.

During Mr. Cornell's experience in service and sales work he has developed a plan by which complaints on account of wear and breakage and other difficulties can be charted and segregated by the service department, to convey to the engineering and sales departments exact and immediate information as to the cause and seriousness of any wrong design or materials and show what changes in design, inspection, specifications or factory processes may be needed to correct the fault and thus make sure that the same error is not carried through in later production. Excerpts from the paper appear on page 21.

Discussion of Cornell's Paper

Discussion of the paper was opened by E. T. Klee, service manager of the Stutz company, who agreed that a system similar to that outlined by Mr. Cornell would be valuable in assuring co-operation between the service and engineering departments, particularly in large organizations where the two departments did not come in contact frequently.

It was the opinion of E. M. Elliott, general manager, Mais Motor Truck division of the Premier Motor Corp., that the chief problem was to make the management of the concern appreciate the truth of the findings of the service department. It was his belief that the service manager ordinarily was made the "fall guy" to placate the owner who complained of mistakes made in other departments.

George A. Weidely, of the Weidely Engine company, stated that the problem was to get the data in such shape that the management will pay attention to it. He thought that if it was presented in the way outlined in the paper, that it would get attention, and that such a system would go as far as anything to make the American motor car a better car.

R. H. Combs, consulting engineer and traffic manager Prest-O-Lite company and secretary of the section, gave it as his belief that a system such as that outlined would have the desired effect; that this co-operation between the service department and the other departments of the factory was a matter of evolution and will work itself out as the industry grows.

Service Manager Drew of Nordyke & Marmon quoted Alvin McCauley in the statement that the advertising department has a very close relation to the service department in that the service department must make the car live up to the claims the advertising department has made for it.

Mr. Cornell suggested an elaboration of the system, or rather, an extension of its use, by which the sales department could tabulate the complaints by territories and thus develop a system for determining which dealers expect too much service attention.

Commenting on the relation of the advertising and service departments, Mr. Cornell stated that the ideal arrangement was that in force in the Stearns organization when one man was both the advertising manager and service manager.

Asked by Secretary Combs what was done in case broken parts were not returned, the speaker stated that some concerns had a parts auditing service in which traveling auditors examined and passed on defective parts turned into the dealer and at the same time assisted them in maintaining their parts stock.

David Landau, consulting engineer of the Sheldon Axle & Spring Co., said that the service department system eliminates the mortality of parts in the new design, and asked upon what basis the efficiency of parts was calculated. That is, what should be the assumed life of a part, or life of a car? In answering this, Mr. Cornell said that the effort was toward making a replacement of parts as nearly constant as possible; that is, in having one part come in for replacement no oftener than others. It is to be assumed from this that Mr. Cornell had as an ideal car one in which no one part wore out quicker than another, and that when it failed, it failed completely like the classic "One-Hoss Shay."

This brought on a discussion as to what should be considered the life of a car or the life of parts, and when should the factory cease to replace parts. This elicited information from Elliott of Mais that European truck and omnibus makers figured on a life of 20 years, charging off 5 per cent for depreciation annually, that many American truck users calculated on a basis of 10-year life. Mr. Combs stated that the Prest-O-Lite company made its calculation on a basis of 4 years life for its trucks.

Chester Ricker of the Stutz company brought out the fact that the 20-year and 10-year assumptions were in force only when very complete and very regular and frequent inspection and overhauling were enforced. It was the concensus of opinion that the short life for most American trucks was due to the more vigorous service demanded by American users such as overloading, poor roads and streets, and less frequent inspection. The question as to the life of the car or part was rather left up in the air when Cornell closed this present discussion by the statement that the limit of replacement must be a commercial problem.

Preliminary to Mr. Cornell's paper, Mr. Grimes, of the National company, explained an easy method of determining the power and ability of the car with the stop watch and speedometer as the only instruments required, and developed some instructive curves showing some very interesting results. This formula and its application will be explained in a later issue.

GOTHAM ENGINEERS MEET

New York, Feb. 25.—At the regular February meeting of the Metropolitan section, Society of Automobile Engineers, held at the Automobile Club of America last night, Leonard Kebler, President the Ward Leonard Electric Co., was elected chairman; Harry Tipper, advertising manager, Texas Co., secretary, and H. G. McComb, engineer the General Vehicle Co., treasurer.

The program for the evening included a symposium on motor testing and was provocative of a valuable discussion on the real needs of testing commercially. The topic was introduced by Peter Payne Dean, former engineer of the Diehl Mfg. Co., who took the viewpoint that it is not necessary to secure horsepower readings at the rear wheels, and therefore the installation of dynamometers for the purpose represents a greater expenditure than is justified by results.

This viewpoint was discussed by C. F. Scott, engineer of the Sprague Electric Works, and others. The net result of the

discussion seemed to be that some form of testing is necessary but there was evidently a disagreement among the members present as to whether or not the expense of the dynamometer equipment is justified.

In bringing forward his arguments Mr. Dean stated that in his opinion the blower system fits the situation best of all, assuming of course that the exact horsepower at the rear wheels is not to be measured accurately. The movement of the air in absorbing power does not create heat and furthermore the installation is not expensive. The air can be used to cool the radiator and thus simulate the actual conditions of running the car.

STATIC CHARGES FROM BELTS

Des Moines, Ia., Feb. 26—Warning against an interesting as well as dangerous cause of conflagration in a garage is sent out by the school of motor car mechanics of the Highland Park college of engineering, Des Moines. An experience in the shops there developed how much danger is involved. The engine in a car was connected by a belt with an overhead shaft by which it was run. The tires were on the car, which insulated it, and the friction of the belt generated electricity.

A student passing the car leaped high in the air when a spark jumped from a mud guard into his leg. Experiments showed that it was easy to get sparks ½ inch long from any part of the car. The gasoline can carried past the car and coming within ½ inch of a hub or fender would have been ignited by the electric spark.

Where motors are propelled by belt, a wire should be carried from some convenient part of the car to a water pipe or other ground connection to carry off the electricity generated. In all cases, great care should be used not to carry gasoline cans near such cars while the belt is in use. Only 5 to 10 minutes were required to get a fat spark, after the car had been discharged and a number of sparks can be obtained after the belt connection has run that length of time.

WAR TRUCKS SINK IN RIVER

New York, Feb. 25—Sometime during last night a scow loaded with 150 motor trucks believed to have been consigned to the Allies broke away from its moorings in Weehawken, on the New Jersey side of the Hudson river, in some mysterious manner and finally sank in 15 feet of water off the Weehawken mud flats.

It is thought that the float was set adrift by persons whose intentions were to prevent the shipment of the trucks to Europe for military purposes. Derricks are raising the crated trucks.

It is said that the shipment of trucks was sent from a factory on Long Island and that it was to be loaded on the British tramp streamer Student, due to sail for Liverpool in a few days.

Anticipating the Complaints

A Scientific Application of Service Experiences to the Prompt Betterment of Production

By F. A. Cornell

THE application of service experiences, in automobile practice, has too often been a matter of commercial policy rather than of scientific improvement. The most unfortunate part of this is that opportunities for future difficulties are by the prevalent means so often increased instead of lessened. Extreme liberality is almost invariable in good will adjustments; but it is peculiar that the same broad executive policy usually overlooks the intensive developments that are so positively indicated by a careful study of service replacements.

One fact alone will almost conclusively support the foregoing: The greater number of alterations in design and manufacturing detail are made following complaint from some strong factor in the distributing system. It has been shown as possible by the methods hereinafter outlined to anticipate practically all of such vigorous complaints of detail and parts breakage from the field.

There are factories that have approached an exceptional extreme. In one it is possible to make a careful analysis of a sample from the original bar of stock used in the production of any broken part returned. The excellence of this car is a matter of world-wide comment, and an outline of methods employed in large quantity production will show that somewhere near corresponding results can be obtained by much simplified means.

The first and easiest step is to build up a complaint system. Through some convenient but invariable path all criticisms should be cleared, analyzed, tabulated, and reported to all interested departments. Grouping of such complaints under several general divisions of car lay-out is too generally used to require further explanation.

But the immediate and vigorous study of these reports is more often from commercial than technical sources. Possibly it seems beyond the reasonable to expect a capable engineer to give ready heed to comments that are so often unfair, and so very seldom thorough. But the fact remains that a complaint system usually requires the vigorous insistence of a commercial executive before real action is taken.

However, the complaint system should be retained and supported by another method that introduces mathematical analysis. Possibly all the necessities for replacements might be divided between two general causes: (1) The wear, or (2) the breakage of individual parts. These may be subdivided as falling in one or another of four groups, by the cause of the damage. In further detail these four groups might be adapted to more exact usage along the lines of the following:

CAUSES FOR REPLACEMENT

Worn—W, or Broken—B.

1. Inherent Defects.
   - (a) Flaw in Texture.
   - (b) Error in Alloy.
   - (c) Early Crystalization.
   - (d) Wrong Material Specified.
2. Manufacturing Irregularities.
   - (a) Wrong Material Used.
   - (b) Incorrect Treatment.
   - (c) Error in Machining, etc.
   - (d) Improperly Assmbled.
   - (e) Lack of Thorough Inspection.
3. Damaged in Normal Service.
   - (a) Failure of Associated Mechanism.
   - (b) Adjusting Assembly not Reasonably Permanent.
   - (c) Insufficient Provision for Lubrication.
4. Damaged in Abnormal Service.
   - (a) Lack of Reasonable Lubrication.
   - (b) Lack of Reasonable Adjustment.
   - (c) Driving Accident.
   - (d) Unusual Driving Damage.

It is true that a tabulation of all known replacements offers only on indication of efficiency. Mathematical accuracy could be had only by analysis of all replacements. But the repeated contributions of "the kicker" offer opportunities that should be improved as scientifically by the technical departments as they are concluded diplomatically by the selling staff.

The primary point of this paper is to indicate that more attention has been given toward seeing "the kicker" satisfied than in being scientifically certain that each possible cause for complaint is quickly corrected. Let us illustrate how such purposes may be accomplished by sketching the development of a quantity producer's efforts. His scientific scheme was disguised as a game. Even the day laborers became interested in the fluctuation of a "Parts Batting Average."

Each piece returned for replacement or repair was carefully inspected. The cause leading to its condition was reported by the code of our brief (such as W2c advising the recording and corresponding clerks that the part was worn through an error in machining and therefore in line for free replacement).

It should be noted that those causes that were up to the car owner are listed as Group 4. It was the plan to exhaust the possible application of any of the rulings under 1, 2 and 3 before refusing credit on the grounds that the factory was not to blame for the damage. It is imperative that fairness be maintained, but that in any case of doubt the customer should be given the benefit and that the manufacturers should carry such doubts as reason for careful watch and study.

This is as far as the ordinary system goes. Now for the "Batting Average." On a sheet, such replacements were tabulated by part numbers. The sub-totals may be taken to show repetitions from individual causes. But, better than all, the entire replacements of a part were computed against the total production of that model to the first of a prior month. Should 1,200 cars have been delivered up to May 1st, and if 12 transmission countershafts, No. 4,901, had been replaced up to June 1st of the year, the efficiency of that piece was 99 per cent.

The Score Board

Such percentage figures make fine information, but more was wanted than to know. A blackboard was placed where the men congregated and the parts leading in non-efficiency were listed thereon in the order of their disfavor. Associated departments soon vied with each other in efforts to excuse the humiliation of leading the list. The jeering remark, "You fellows have a lot of heavy hitters this week," did more to clean out the weaklings than any one other scheme.

Reference again to Sheet A will show that Group 1 covered causes within the selection of materials, usually applying to outside suppliers. Group 2 covered errors properly chargeable to a factory department. Group 3 to the engineers and Group 4 to the user. The Service Department, with sales co-operation, constantly strived to reduce the replacements due to causes within Group 4 by vigorous educational efforts.

But even the "Batting Averages" and the "Score Boards" seemed to have limitations. Final and most intensive application of all service experiences was not obtained until the breakage was plotted, the number of breaks of each part giving a complete cause which showed the number of breaks of every part. This was the effective step in anticipating complaints, since the relative efficiency of associated parts was so graphically shown.

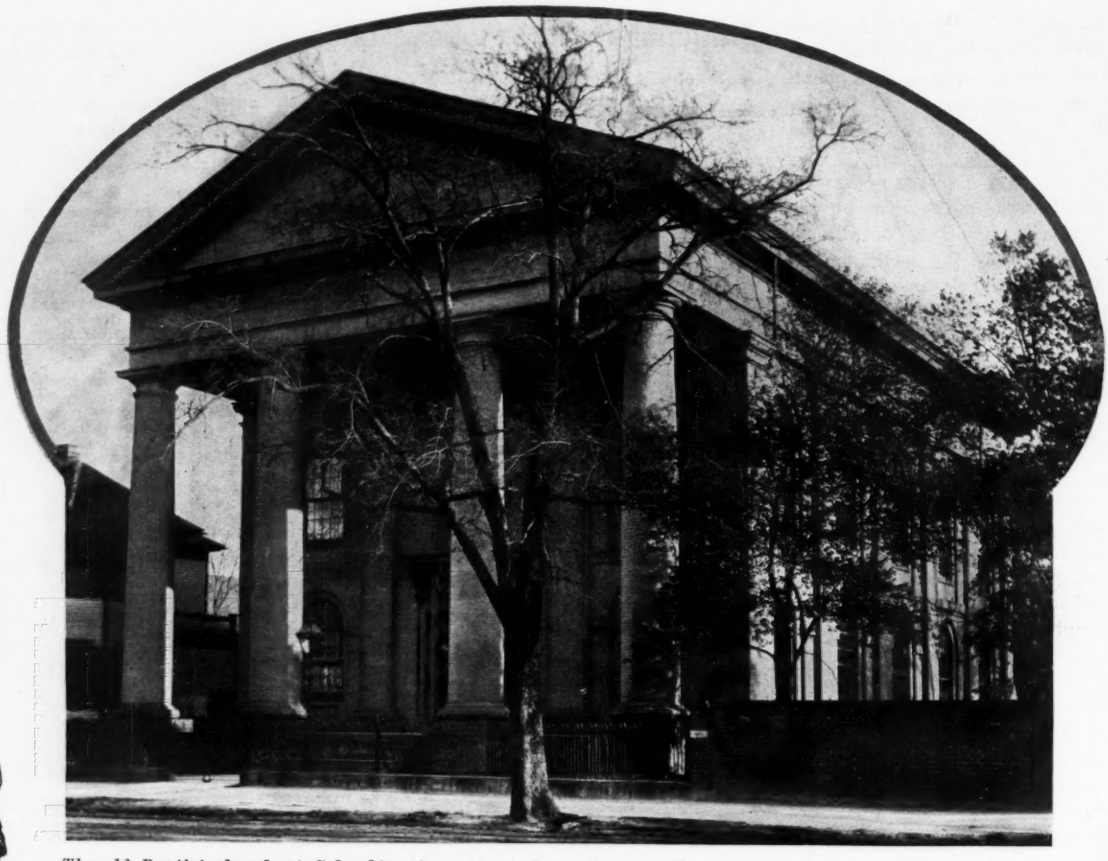
A great many successful enterprises have been developed upon the principle, "The Customer is Right." While some merchants seem to disagree with so broad a policy there will be a few so stubborn as to deny that many purchasers having a just complaint do not present it to the vendor. Most men want to live agreeably.

It is, therefore, easily possible for some serious faults to go along unchecked unless all the known sources of complaint are tabulated and anlyzed. The best trade connections would far rather send in orders than complaints. When they do find fault it is often from just causes that might have been quickly corrected by scientifically cultivating "the kicker."

A careful plotting of a service curve, a broad belief in the fairness of humankind, and a vigorous determination to be sure that we are not at fault before blaming the buyer—all these go far toward the perfection of car design. The purpose of this paper is to suggest the application of simple and convenient figures as a stimulant to correction before a wide harm is done.

FORD TO BUILD 3,000 A DAY

Detroit, Feb. 24—Ford officials say that within a few days they will very likely reach the high production mark of 3,000 cars in one day. At the plant of the Ford Motor Co., more men are being added, the working force now being close to 28,000. Production is at the rate of 66 per cent better or more than for the corresponding period in 1915. There are still about 115,000 unfilled orders on the books now. On Jan. 26 there were 127,485.



The old Baptist church at Columbia where the first meeting of the secession convention was held in December, 1860

Columbia, S. C., the Cradle of the Confederacy

By J. C. Burton

FIVE hundred and twenty-five miles—if you measure the distance by the flight of the crow—southwest of Philadelphia, the birthplace of the United States of America, lies the cradle of another independent government that is as dead as the doctrines on which it was established, a government born of states' rights and secession, a government whose 4-year history is penned in the crimson ink of war—the Confederate States of America.

On Washington-Atlanta Highway

The cradle in which first was laid the ill-fated babe that was destined to know only sacrifice, hunger and ultimate defeat, is Columbia, the capital of South Carolina, and the city in which the leaders of the state met in December, 1860, to sign the ordinance of secession, a document that fired the other southern commonwealths to similar action and brought on the "most hideous of wars, a war of estranged, embittered fellow countrymen."

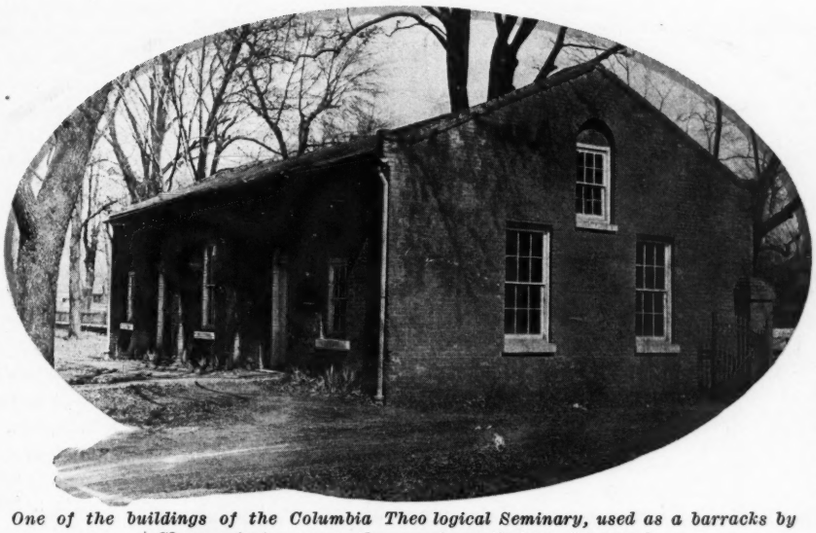
To reach Columbia, which is located almost in the center of the state and on the east bank of the Congaree river, the motorist on the hither side of the Mason and Dixon's line follows the Washington-Atlanta highway, a road replete with memories of Nathaniel Greene, Baron DeKalb, Lord Cornwallis and William T. Sherman. He travels from the national capital through Baltimore, Richmond, Cheraw and Camden and follows in the wake of mighty armies as he rides through Virginia and South Carolina, two states especially rich in historic attractions that recall the heroism of two great conflicts.

Philadelphia has her Independence Hall and Columbia her old Baptist church. In one, the fathers of the republic assembled to throw off the yoke of British oppression; in the other, the most passionate advocates of states' rights met to sign the divorce papers of North and South. If you think as I do, you associate Independence Hall with the "shot that was heard around the world," and the old Baptist church with the bullets that pierced homes and made of brothers enemies on the field of battle.

Convention Met in Church

Architecturally, the old Baptist church, or Secession hall, as it is called in Columbia, is an impressive building although it has no towering steeple like the historic churches at Charleston and Savannah, whose chimes made war music with the booming cannon. It is a large edifice of brick, with four great pillars across its front. It is of commanding interest to the tourist because of the dramatic scene enacted there on the seventeenth of December, 1860.

On that day, the eyes of north and south alike were centered on Columbia. Francis W. Pickens, a disciple of Calhoun, was inaugurated governor of the state. In his inaugural address he declared: "There can be no compromise. It is our sincere desire to separate from the states of the North in peace. But, if, under the guidance of ambition and fanaticism, they decide otherwise, then be it so. We are prepared for any event." From the state house, he went to the secession convention with the delegates, who, in the house of worship, were determined to act as the new governor had spoken.



One of the buildings of the Columbia Theological Seminary, used as a barracks by Sherman's troops on the march north from Savannah

A Session of State Notables

The secession convention was a body "worthy of the momentous action about to be taken," James Ford Rhodes writes in his history of the United States. "The predominance of white-haired men attracted the attention of all observers, and nearly all the delegates had passed life's prime. Among them were many who had represented South Carolina with ability in the national house and senate; five had been governors of the commonwealth; many members of that dignified judiciary whose title came from legislative election, and whose places, bearing ample compensation, were of life tenure, had come forward to lend their guiding hands to their state when she was on the point of taking a step fraught with far reaching consequence. The leading lawyers of the state were present, while prominent Methodist and Baptist ministers, railroad presidents, men of business and influential planters completed the roll of this convention."

On the canvas of your imagination, you can picture the scene—the delegates in secret and deliberative session within the church and the restless throngs on the street outside, eagerly awaiting the word that South Carolina was no longer a member of the Union and that she was free from the tyranny of northern, anti-slavery republicanism for which Lincoln stood.

But that message was not to emanate from Columbia. An epidemic of small pox was raging in the capital city and the delegates, hearing that fourteen new cases of the loathsome disease had broken out that morning, adjourned to meet in Charleston the following day. Thus, a plague robbed Columbia of the glory that her citizens anticipated and gave it to Charleston, but the old residents of the capital point with pride to the Baptist church, call it Secession Hall and say: "The ordinance surely would have been signed there but for the small pox epidemic."

The Hamptons of Columbia

In fact, Columbia's charm is largely of a martial character. There is no name in the Blue Book of the city more illustrious than that of Hampton, a family from

Pillars of the ruined mansion at Millwood, the pre-bellum estate of the Wade Hamptons, and one of the most picturesque of Civil War landmarks in the South

The old Caycc house, located two miles south of Columbia and fortified and occupied by the British army during the Revolutionary War

which sprung two of America's greatest warriors, one of whom, the father, drew his sword against the British in the Revolution and the War of 1812, and the other, the son, fought under the banner of the stars and bars.

Wade Hampton, Sr., was one of the dramatic figures in the struggle for American independence. With Thomas Sumter, the Carolina gamecock, and Francis Marion, the swamp fox, he rode in pursuit of the redcoats through the south and after the fall of Yorktown, served two terms as a representative in congress. Elevated to the rank of brigadier-general, he was in command at New Orleans from 1809 to 1813 and directed the operations of the army along the northern border in the second war against the British. He was reputed to be the wealthiest planter in the United States and the owner of more than 3,000 slaves.

A Historic Burial Ground

"The paths of glory lead but to the grave," as Grey wrote in his immortal elegy, and a grave and a memory is all that remains in Columbia of this Revolutionary hero, who is buried in the cemetery of Trinity church, near the last resting places of General Peter Horry, the right-hand man of Francis Marion; Henry Timrod, the southern poet; and Lieutenant-General Wade Hampton, his son, who led many a charge against the flag for which his father fought.

Wade Hampton, Jr., is the idol of Columbia. "You will find his picture, with that of Robert E. Lee, in every house," my guide told me. At the outbreak of the Civil War, he formed and equipped at his own expense a command of cavalry, infantry and artillery that was known as Hampton's Legion and at the head of which, he won distinction at the first battle of Bull Run and at Seven Pines, where half of his troops were killed and he himself severely wounded. Upon his recovery, he was made brigadier-general of cavalry and played an important part in Lee's northern invasion and the battle of Gettysburg, later making a brilliant stand against the advance of Sheridan through the Shenandoah valley. He attained the rank of lieutenant-general in 1864 and was placed in command of Lee's entire cavalry forces. Near the close of the war, he attempted to prevent Sherman's northward advance from Savannah and at this point in our narrative, we come to Millwood and Mary Kate Sally Ann.

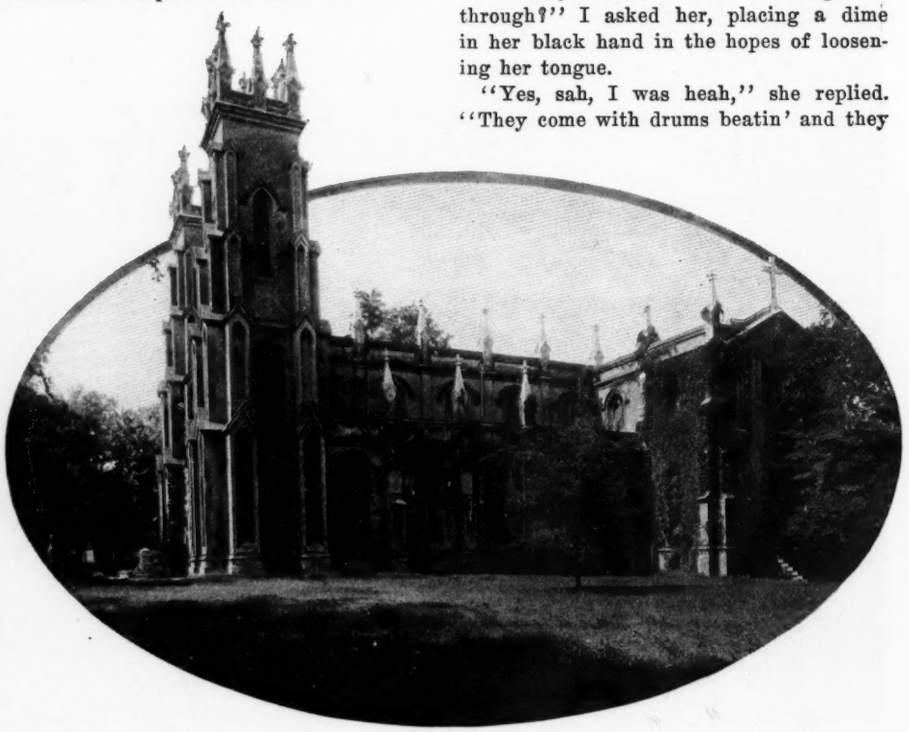
Wade Hampton's Abandoned Estate

Millwood is the former home of General Wade Hampton, located about 4 miles from the center of the city on the Garner's Ferry road and the most attractive of Columbia's attractions. All that remains of the once stately mansion are five great pillars, covered with climbing ivy and showing white through the foliage of the trees from the highway. They seem emblematic of the lost cause for which Hampton fought. They are broken and burned in places, but many of the scars are hidden by the vines, and although worthless, they are proud old columns nevertheless.

Mary Kate Sally Ann is one of the few surviving members of the great retinue of slaves that once served the Hamptons, sire and son. She lives in one of the cabins on the abandoned estate and her only fault is that she is not loquacious. Were she inclined to talk, what wonderful tales would pass from her toothless mouth, for under her grey head are memories of stirring and dramatic scenes that were staged when she was a pickaninny and housegirl for the lady of the plantation.

"Were you here when the Yanks passed through?" I asked her, placing a dime in her black hand in the hopes of loosening her tongue.

"Yes, sah, I was heah," she replied. "They come with drums beatin' and they



Trinity church, Columbia, in the cemetery of which are buried several heroes of the American struggle for independence

went away with drums beatin', but when they left, the old house was on fiah and all the niggahs was hid in the woods."

"And what is this," I asked the old caretaker, pointing to a small brick house with padlocked door and iron-barred windows.

"That's Marse Hampton's wine house," she said.

"Any wine in there yet," I asked in order to prolong the conversation without the expense of another largess.

"Plenty, sah, plenty and it's some old," was her rely and she smacked her lips.

It was a hot day and the ride from the city had been dusty. Moreover, South Carolina is prohibition territory. I looked at the wine house as a safeblower looks at a bank vault. The gods might have their nectar. All I wanted in the world right then was to brush the cobwebs off a bottle of that rare, old vintage and drink a health to the master of Millwood in some of his own Madeira or Burgundy.

Millwood is one of the many dream places scattered throughout the South, an abandoned estate where one may sit on the magic carpet of imagination and be carried back a half century or more to the brave days of old when the blight of war had not fallen upon Dixie.

Capitol Shelled by Sherman

The state house at Columbia is another Civil War landmark of interest to the tourist from the north. In appearance, it resembles the national capitol at Washington before the two wings were added to the latter building. By looking carefully at the walls on the southwest side of the structure, one sees the marks of artillery fire and a cannon ball imbedded in the bricks. The capitol was the target of the gunners with Sherman's army, who shelled the city from the heights across the Congaree river on the march northward from Savannah.

In one room of the state house are kept the sacred relics of the Civil War and on the capitol grounds are several beautiful monuments including the equestrian statue of General Wade Hampton, the Confederate soldiers' monument erected by the women of South Carolina, and the bronze palmetto tree moulded in memory of the men of the South Carolina regiment that lost their lives in the Mexican war.

The Presbyterian parsonage at Columbia, the boyhood home of President Woodrow Wilson

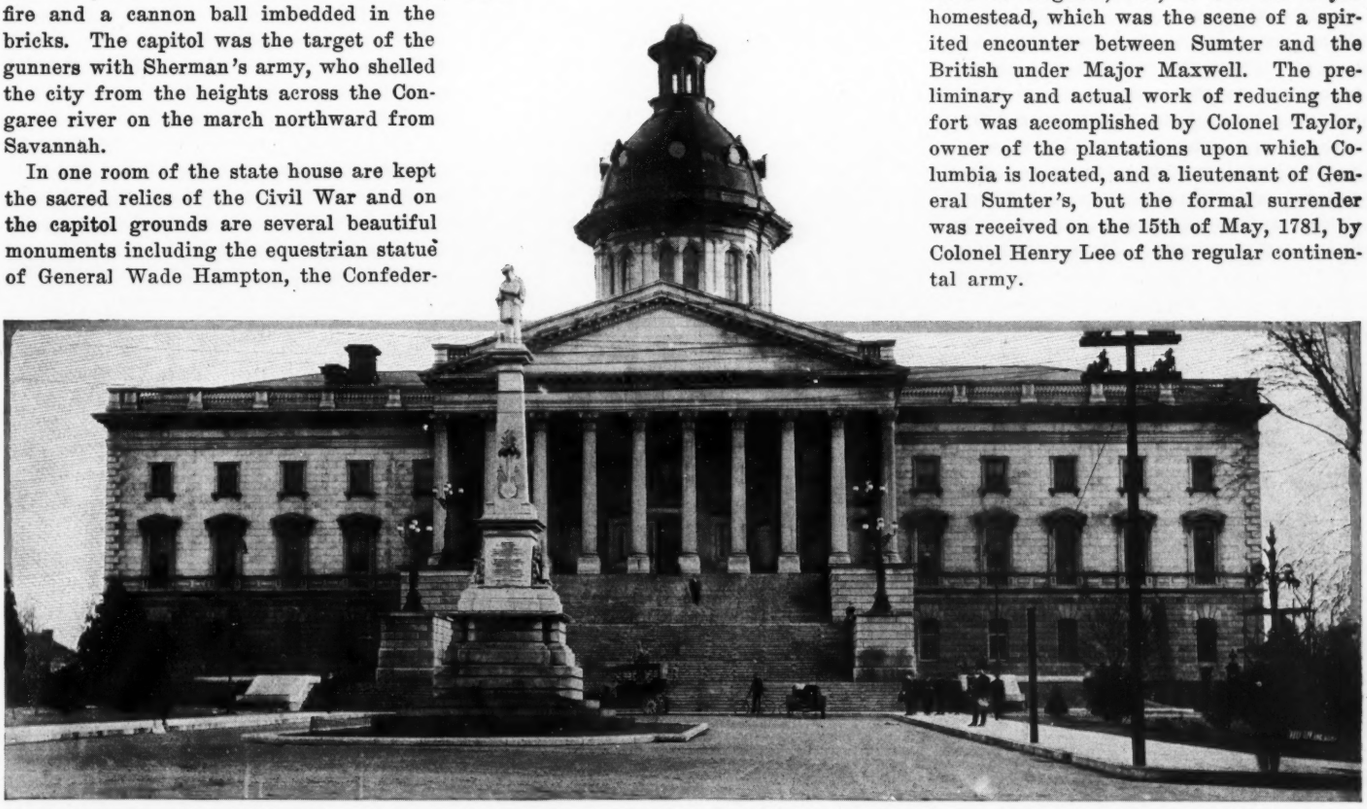
The name of William T. Sherman also is associated with the Presbyterian Theological Seminary, located at the corner of Taylor and Pickens streets, for the old dormitories and classrooms of this venerable institution were used by the Union soldiers as barracks when the conqueror of Georgia took possession of Columbia in the waning months of the internecine conflict.

Near the seminary is the Presbyterian parsonage, where Woodrow Wilson, president of the United States, spent his boyhood days, his father being an instructor in the school and pastor of the Presbyterian church.

Unique in the annals of history is the fact that there is a grave on the grounds of the state capitol. It is that of Swanson Lundsford, a captain in the Revolutionary army who died from yellow fever and is buried in what was once his garden.

House Fortified by British

Two miles south of Columbia, on the road to Augusta, Ga., is the old Cayce homestead, which was the scene of a spirited encounter between Sumter and the British under Major Maxwell. The preliminary and actual work of reducing the fort was accomplished by Colonel Taylor, owner of the plantations upon which Columbia is located, and a lieutenant of General Sumter's, but the formal surrender was received on the 15th of May, 1781, by Colonel Henry Lee of the regular continental army.



The state house at Columbia, shelled by Sherman on his march from Savannah to join the Army of the Potomac

Belgium Reorganizing Motor Corps Despite Handicaps

Mechanical Derelicts of War Being Repaired in Shop Located on French Soil

Where war and peace meet. German war car passing field where Belgian farmer is at work with the plow

PARIS, Feb. 15—With all but a few square miles of her territory in the hands of the enemy, with all her motor car factories held by the Germans, with her government established in allied country, and with half her population scattered, it is evident that the task of reorganizing the Belgian army is one that might cause the strongest men to quail. The fact that Belgium has not given up the fight, that she stubbornly declines to admit she is beaten, and that she has been and is still preparing to wage war on the invader, is the most heroic feature of the great world conflict.

The motor section of the Belgian army is the one presenting probably greater difficulties than any other. There are no factories behind the service, and in consequence no more cars can be built and no more spares obtained for the machines still in a condition to be repaired. When any other of the warring nations approach the motor car repair problem they have buildings, machinery, trained staffs and material at their disposal. Belgium has nothing.

Working in French Seaport

I have just been given an opportunity of seeing how, out of nothing, Belgium has got together a motor car repair service equal to that of any of her allies or enemies. At a certain French seaport, a big plot of ground was turned over to the repair department. On this barren grass land overlooking the sea, all the Belgian cars which had been abandoned in various parts of the country, were brought in on freight trains. When I visited the ground there were two thousand of them, classified according to make, neatly lined up in the muddy field, battered and scarred and scorched and riddled by months of warfare and neglect.

When Belgium was invaded, every kind of motor car was thrown into military service. High-grade Minervas and Pipes and Savas, with bodies by Van de Plas and other artists, were made to carry muddied troopers, wounded men, raw meat, loaves of bread, barbed wire, horse shoes, anything and everything that an army can need in the field. When the cars broke down under rough work and tremendous strain to which they were subjected, they were abandoned in farmyard or garage, by the roadside or in the ditch.

Making Junk Into War Cars

With the reorganization period, however, they were collected, brought to this nameless seaport in France and entrusted to the repair staff. Everything on wheels was brought along and made to take its place in the long line of mechanical derelicts. Under a body which had been splintered by shell, scorched by the sun and rotted by the rain there might be a first class chassis ready for further service after a minimum of labor. Others were down and out. On the edge of the field I noticed an Overland, or what once had been an Overland. For wheels there were a few spokes, one-half the rear axle was gone, the frame members were twisted and buckled, two cylinders were missing in the literal, and not the sense usually given to that word; the radiator had ceased to exist—the whole car was junk such as you never saw junk on the junk heap at home. Other cars were in equally bad condition.

On that barren plateau overlooking the sea, Belgian soldiers had built huge all wood repair shops. The main building measures 900 yards by 600 yards, probably the biggest repair department under one roof the world has ever seen. No civilian, whatever his position or influence, was allowed to get within hailing distance of that building unless accompanied by a military officer. The Belgians have learned nearly all there is to be known about German intrigue and plot and are not taking any chances with fire and explosion.

Road Building Necessary

For motor cars to reach those buildings was not an easy task, for no roads existed. At the time of my visit American trucks, most of them 3-ton Kelly-Springfields, were hauling loads of stone from the beach about a mile away and dumping them on the roads which had been mapped out, while gangs of men broke them to suitable size, rolled them in and created a solid road.

Electric power and light had been obtained from the adjoining town. America, France and England had furnished the necessary tools and machinery. Belgium alone provided the labor. While the repair department was housed under one huge roof, the building was divided into sections, each one under a distinct staff and devoted to the repair of one particular type of car or truck. Thus, one section dealt with

A Belgian armored car in service after being repaired in temporary workshop

motorcycles only; another built a standard type of ambulance body and fitted it to a certain make of chassis; another section handled nothing but American trucks; further on only Minerva cars were received and doctored.

The repair of American trucks constituted the least difficult of the many tasks the depot had to undertake, for sufficient spares have been ordered from the American factories and are available by the making out of a requisition form on the stores department. For the benefit of this service, special spare parts lists have been prepared for each make of truck; every part has its description in French and carries a number, ordering from the stores being done by number only.

Expert Mechanics Are Scarce

There is not the same simplicity about the repair of Belgian cars, for no factory can be called upon for spares. However, many of the engineers of the leading Belgian factories are available and under their direction, most of the commonly required parts for the leading makes of cars now are manufactured.

The staff is military, but the officers have the assistance of engineers from the home factories. Thus, the highest civilian authority in the shops is an engineer who before the war occupied an important position in the Pipe factory at Brussels. One of the greatest difficulties the Belgian authorities have had to contend with in their reorganization scheme is that of securing adequate skilled labor. Expert mechanics are not going about Europe with their hands in their pockets at the present time. Men not eligible for military service can earn higher wages than at any time in the history of the engineering industry, while those who are under the direction of the army authorities are not allowed to waste their efforts. Belgium has never had the same stringent compulsory military service as France and Germany, very few of her married men being obliged even now to serve in the army. Thus, when the country was invaded, the workers in the engineering trades, who escaped to France and to England, found plenty of work awaiting them, and are employed at the present time in the factories of these two countries.

The staffs are made up of young mechanics still eligible for military duty, of engineers and mechanics who volunteered for active service when war broke out and have since been drafted into the army repair department, and of old men for whom the active army has no further service. Even these men, if they are of real value, only can be obtained by competition with the English and French shops, and as these shops were the first to enlist the skilled refugees, it is not an easy matter to get them transferred to the official Belgian departments.

Dealing With Unskilled Workmen

It has been necessary, also, to deal with the younger men of military age, but with no technical experience, who would prefer to be in the workshops rather than in the line regiments. Many of these used whatever influence they possessed to have themselves posted as skilled mechanics, but a few minutes in the shops was sufficient to show that they had everything to learn about mechanics and motor cars. Restrictions have had to be imposed to keep out these young men whose knowledge is based on imagination. A considerable amount of dilution of skilled labor has had to be adopted, a skilled foreman being put in charge of each department, and each skilled mechanic having two or three unskilled or semi-skilled men working under him.

With the completion of her central motor car repair depot, the Belgian government will be able to relieve those French and English factories which for months past have been occupied on Belgian repair work. The factories can thus devote all their energies on making material for their own armies. The centralization, too, simplifies shipping and control, it being an easier matter to send damaged cars into one central depot, within easy reach of the Belgian lines, than to distribute them among a series of factories in various parts of two countries.

Charged with Fraud

Van den Plass, the world-famed Belgian body builder; Captain Mausi, for many years a leading motor car agent in London, and two other Belgian subjects are now before the military court at Calais on a charge of defrauding the Belgian government. It is declared that the sum involved is from $10,000,000 to $12,000,000, the case being so serious that the Belgian government is acting as civil prosecutor.

Soon after war broke out the men involved were sent to England to make purchases of motor cars for the Belgian army. A little later they obtained other purchasing commissions for all kinds of material required by the Belgian army. It is declared that they have obtained enormous fraudulent profits on these transactions and on an inquiry being opened a few days ago, it was discovered that they had made cash deposits in a London bank totalling $340,000.

Fleet of Paris motor buses, now being used to transport soldiers to the battlefields

Before the war Van den Plass was at the head of a body factory at Brussels, where he employed 4,000 workmen. He was generally recognized as one of the most artistic body builders in the world.

Have You Relined Your Brakes?—How It Is Done

The Whys and Wherefores of Doing Work Easily and Efficaciously

By Marcus Dods

THERE comes a time when the material used as a brake lining has lost its usefulness, due to long service, and it then is necessary to reline the brakes with new fabric. This is a job that most people prefer to place in the hands of a repairman but for those who enjoy doing their own work the method will be explained here.

It is best to purchase the new lining in one piece, cutting the necessary lengths after the wheels and brakes have been removed.

To obtain the correct length of material, lay a tape measure around the outside of the external brake band allowing for an over-lapping of about ½ inch at the edges of the band opening. This will give the proper length for one external brake. Deduct from this 1½ inch, which will be the length for the internal brake.

Removing the Brake Bands

Jack up the rear wheels and, if possible, place the axle on good strong horses or blocks so as to guard against any accidental slipping of a jack. If the horses are not available, block the front wheels securely to prevent the car from rolling ahead or back off the jacks. Consult the instruction book on your particular car as to the proper way to remove the wheels, and follow these instructions carefully. The toggle connections of the brakes usually are held in place by a large clevis pin, on the back of which is first a washer and then a cotter pin.

Disconnect the toggles from the brake shoes and remove the adjustment screw from the guide that acts upon the anchor bar. Remove the various coil springs that are attached to the shoe or band and the brake is now ready to be taken off. Before removing it be careful to notice which is the top and bottom of the assembly and also observe just how the spring is inserted between the guide and the anchor bar. In fact, it is well to be exceedingly careful in removing any part of either brake so no mistakes will be made when the brake is ready to be replaced. Clean all of the parts thoroughly with gasoline and remove all of the old grease that may be around the dust guard and axle stub.

By putting the band in a vise, as in Fig. 1, and using a cold chisel and hammer, the copper rivets that hold the lining to the band may be chipped off, then drive out the old rivet ends with a small punch or drift.

In cutting the new lining, allow for the over-lapping, as has already been explained. This is necessary because the rivet holes at this point are very close to the edge and to leave the lining short here would allow it to tear when the holes were drilled. See Fig. 2 for the method of determining the correct length. If the old lining is in such condition that it can be removed intact, the new measurement can be obtained by using this as a guide.

As the average private garage is not equipped with a full complement of the necessary tools to enable one to do this work as it is done in a service station, simpler means will have to be used.

In marking the lining for the holes, lay the wheel on a bench or the floor, hub side down, and putting the lining and band in place on the drum, as shown in Fig. 3, wire the band so as to hold it in place correctly. With a pencil or soapstone stick and using the holes in the band as a template, mark the lining. The holes can be made by using a harness leather punch, as in Fig. 4.

Securing Band to Lining

With the aid of a few small bolts and nuts placed at intervals, secure the lining to the band in its proper position. The next step is to countersink the holes so the rivet heads will be below the surface of the lining. To do this properly one should use a countersinking tool made for such purposes, but as these are usually a scarce article, one can get good results with a wood screw countersinking tool and a brace. If the latter is used it should be sharp or the lining will tear.

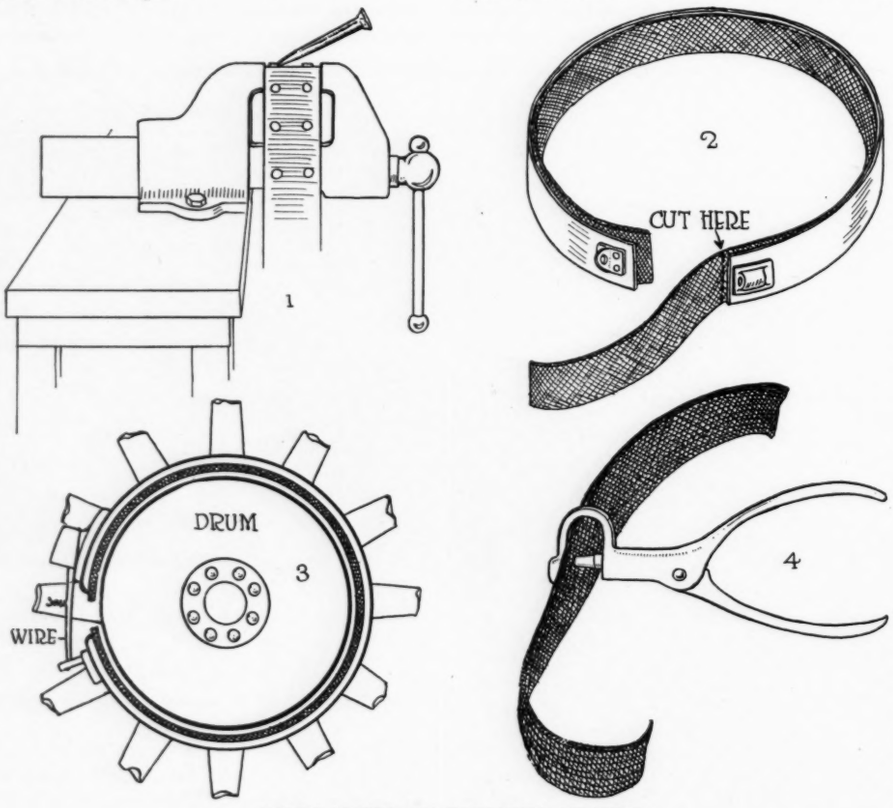
If a vise is not available, place the band on the bench in such a way as to hold it from slipping away, as in Fig. 1, page 29, and with the countersink bit, countersink each hole. Do not go too deep in this operation, only enough to permit the rivet heads to be well below the lining surface.

To do a good job of riveting, it is almost necessary to have a vise, unless there are two people, one holding the band and rivet bar while the other is using the hammer. Fig. 2, page 29, shows a way of using an old bolt held in a vise with the head of the bolt resting on the arm of the vise to give a solid foundation.

Insert a rivet through the lining and band and with the whole in place as in Fig. 2, page 29, the head of the rivet resting on the bolt, draw the rivet snug with a rivet set, or a short piece of small gas pipe. Two or three blows with a hammer will be enough to draw the rivet head and lining tight and in place, too much pounding is very bad as well as unnecessary as it will only tend to draw the rivet deeper in the material and perhaps weaken it to the point of breaking through.

It may be found that the rivets are too long, or too short, not over $\frac{3}{16}$-inch should be protruding through the band. In riveting over these ends remember that quick, light blows are better than heavy ones. The light blow will spend its force upon the desired point while the heavy one will carry clear through and tend to draw the rivet head in the lining too tight.

This operation is performed with the



FIRST STEPS IN RELINING BRAKES

Fig. 1—How to cut the old rivets; Fig. 2—Measuring the new lining; Fig. 3—Wire the bend to hold it in place; Fig. 4—Make the holes with a harness punch

brake in the same position as when using the rivet set. This is illustrated in Fig. 3. Do not remove the bolts that were used as temporary holding until the holes not occupied by bolts have been filled with rivets.

This will complete the foot brake and the same methods are used in relining the internal or hand brake.

The task of applying the lining to the internal shoe is much easier in one way because the material is being drawn over an outside surface instead of to the inside of the band. Fig. 5 shows the difficulty arising in the latter instance, which is, allowing the lining to "cut corners" from one point of attachment to another. Hence the method illustrated in Fig. 3 for securing an accurate marking of the holes.

The various methods just described are applicable to the internal brake with the exception of the marking for the holes. It is not necessary to put the shoe in place with the lining as with the external band. When the lining has been cut, making the same allowance at the ends as was given for the foot brake, mark and punch the first two holes at one end and attach this end with bolts in its proper place on the shoe.

Now stretch the lining over the shoe and mark and punch the holes that are opposite the split in the band. Do the same with the last two holes and complete the temporary attachment. Proceed with the riveting the same as with the foot brake.

Replacing the Brakes

Replace the brakes, being careful to secure every part in its proper position. It will be necessary to make a complete readjustment and in the issue of February 24, 1916, detailed instructions are given.

Before putting on the wheels it would be well to clean the bearings and pack them in fresh grease.

A great deal of brake trouble is due to grease leaking from the differential housing through the axle tube and thence into the brake mechanism. Although practically all axles are provided with some means to prevent this leaking of grease a certain amount will get through.

In Fig. 4 is shown a simple means of remedying this difficulty for a time at least. Cut from a thick pad of felt a strip that is long enough to be wrapped around the axle bar three or four times. This felt should be thick enough so as to fit snugly between the bar and the housing and wrap it around the shaft as shown.

DROPS TRAFFIC OFFICERS

Minneapolis, Minn., Feb. 25—After nearly 5 years of experience with traffic officers, the city is now getting along without them. The semaphores lie idle and traffic is taking care of itself. This does not mean that Minneapolis has retrograded to a rural class or that traffic is so well educated that it can take care of itself. In fact it was helpless the first 2 days of the change. Even the street-car stop lines were missing. One can now cross the street intersection diagonally without being hauled up. After trying several forms of semaphores, one of them manufactured by the police department from a discarded motor car, the city had just adopted a standard semaphore and put in its order.

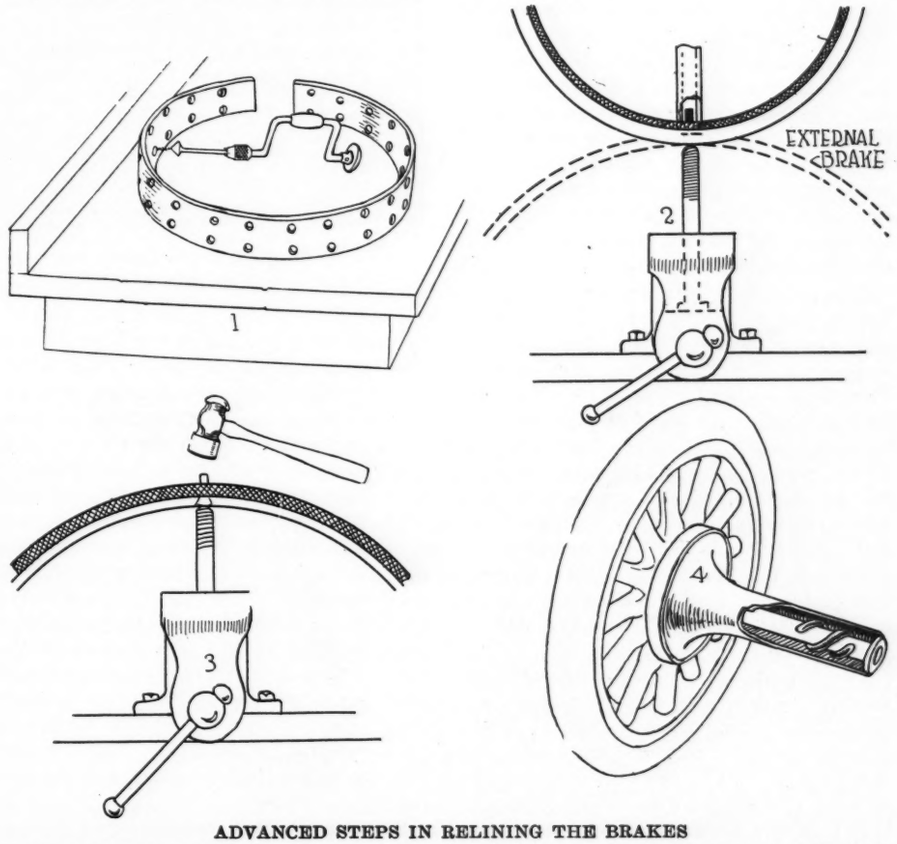
FIG. 5—DO NOT CUT CORNERS
Effect of improper positioning of the holes

The reason for the change is that the twenty-one traffic policemen are now on night duty. The public is inclined to believe that the mayor made the order to convince the people that $100,000 more a year is needed to police the city. Yeggmen were blowing safes under the noses of the police and hold-up men were strong-arming the public at will, motor car gangs were robbing residences in squads and masked bandits were holding up stores and saloons promiscuously. The mayor decided to divert the traffic men to night police work and he did. The street car company put men at the car corners left bare by the police, but the public is not yet used to the gray uniform instead of the blue, and balks at orders.

GUAYULE RUBBER IN DISPUTE

Monterey, Mex., Feb. 26—The right of the de facto government of Mexico to confiscate and operate the guayule rubber factories and other properties of the Madero family in Mexico for its own financial benefit is to be tested in the courts of Texas. Recently two carloads of crude rubber, valued at $45,000, was shipped by a representative of the Carranza government from one of the rubber factories of the Compania Exploradors Coahuilense, situated in the state of Coahuila. Salvador Madero, a brother of the late President Francisco L. Madero, Jr., is principal owner of the confiscated rubber factory from which the rubber was shipped. The cars were consigned to the Mexican Crude Rubber Co., of Detroit, Mich., subsidiary of the Intercontinental Rubber company of Torreon, Mexico, which is owned by the Rockefeller-Aldrich syndicate of New York.

When the shipment reached San Antonio, Salvador Madero sued out a writ of injunction in the district court there to prevent the further removal or sale of the rubber.



ADVANCED STEPS IN RELINING THE BRAKES

Fig. 1—Countersinking the holes in the brake band; Fig. 2—How to use an old bolt and a piece of pipe as a rivet set; Fig. 3—Riveting the band; Fig. 4—Preventing the leakage of grease with a felt strip around the axle

The Motor Car Repair Shop

Caring for the Battery—Part II.

Knowledge of Construction and Operation Is Necessary if Real Service Is to Be Expected

IT is believed that if the average owner understood a little more clearly the construction and operation of the storage battery, perhaps he could take care of it more intelligently. Many of the abuses to which this very important unit of the starting and lighting system is subjected come as the result of ignorance on the part of the motorist rather than any deliberate or intentional carelessness. The battery is similar in this respect to any other apparatus. The more a man knows about the engine, how it is constructed, and how it operates, the more intelligently can he handle it and take care of it. So it is with the battery.

All batteries used in conjunction with the starting and lighting system are of the form known as the lead-acid type, and there are three main parts to them. These are the positive and negative plates and the electrolyte, which is a diluted sulphuric acid solution. Of course, there are other parts such as the jars, the separators and the connectors at the top, but the three really important things are mentioned first, as they are the parts upon which the whole service of the battery rests.

Odd Number of Plates

In a cell there is always an odd number of plates, due to the fact that there is one more negative plate than positive, since a negative plate is put at either end. This is so that there will be action on both sides of each positive plate—an advantage. All the positive plates are connected together by a lead strap or busbar at the top, with a terminal of this strap protruding through the top of the cell. Similarly all the negative plates are connected together. The series of positive plates are placed between the negatives so that there will be alternately a positive and a negative.

To prevent these opposite plates from touching, they are kept apart by what are called separators. These usually are made of wood, specially prepared and ribbed for the purpose. Sometimes they are made of hard rubber, also. The plate assembly then goes into the hard-rubber battery jar, the bottom edges of the plates resting upon ribs protruding from the bottom of the jar.

Fig. 1—How a perfect plate looks, showing all the active material in the grid

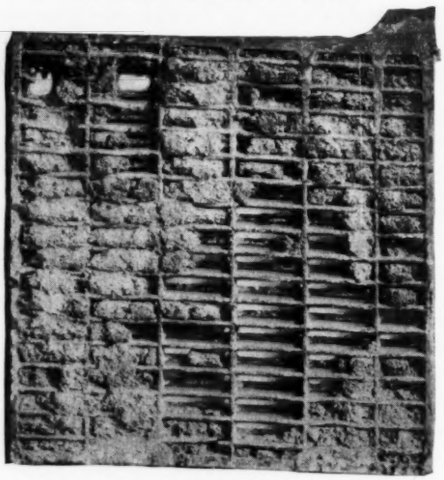


Fig. 2—A worn-out battery plate which has resulted from battery abuses. A good share of the active material has fallen out of the grids

When in place, the jar is covered and then sealed at the top with a tar or asphalt material, only the common terminal for the negatives and that from the positives protruding through the top covering. This assemblage of plates and separators forms the storage battery unit—the cell.

Usually a battery is composed of several cells, the average starting and lighting battery having three cells, making it a 6-volt battery. These cells are connected together by the lead connectors which are either melted to the terminals from the cells or bolted to them. These connectors are what you see on the top of the battery running across from one cell to another.

The electrolyte is poured into the cell and submerges the plate and separator assembly completely.

The lead plates, whether positive or negative, have the same foundation or framework, known as a grid. This is a cast-lead shape made almost of pure lead

Some Definite Data on Plates, Electrolyte, Jars, Etc., for the Education of the Owner-Driver

but containing enough antimony in combination to give required strength. The grid is made up of a series of rectangular cells formed by vertical and horizontal ribs. Into these cells the active material, as it is called, is put to form the familiar plate appearance as shown in Fig. 1.

This active material is a kind of paste, and that put into the negative plates is of a different composition from the positive. Pure lead of a spongy character is filled into the negative plate cells, other chemical substances being combined with it to give it the required body and adhesive properties so that it will stay in place. Into the grid cells of the positive plates is put a somewhat different mixture of lead oxides, such as red lead, and so on.

Suitable chemicals are combined with it to give it the necessary body and sticking qualities. Thus it is always possible to tell a positive plate from a negative because the former has a reddish-brown color, whereas the negative is of a grey shade. Special processes are employed to put the active material into the grid cells and a finished plate has a comparatively hard surface with the active material flush with the ribs forming the sections of the grid.

Action Within the Battery

Authorities differ somewhat as to the exact action that takes place within the cells when storing electrical energy and when giving it out. However, it is fairly well understood that the action is an electro-chemical one. There is no action whatever until an electric current is passed through the battery.

Taking the battery in a completely discharged state as a starting point, both the positive and negative plates are covered with lead sulphate. As soon as the electric current passes through the cell, the lead sulphate on the positive plate is changed to lead peroxide, and that on the negative is split up so that the sulphate part combines with hydrogen in the water to make sulphuric acid, leaving pure lead of a spongy character on the plate. The cell is completely charged when all of the sulphate is off the plates and has combined with other elements to form sulphuric acid.

As the acid is heavier than water, this

causes the gravity to rise as the charging continues, this explaining why the hydrometer reading is an indication of the state of charge of the battery.

When the battery is discharged, or is giving up its current, the chemical action is in the opposite direction, the lead on the negative plate combines with the sulphate to form lead sulphate again, and the peroxide of lead at the positive combines with hydrogen and sulphuric acid to form sulphate of lead and water. Thus the action has completed its cycle and the chemical changes continue as long as the battery is in proper condition. For those who understand the elementary chemistry involved, the reactions taking place during charging or discharging will tell the whole story:

When the Battery Is Being Charged

Action at negative plates, $PbSO_4 + H_2 = Pb + H_2SO_4$.

Action at positive plates, $PbSO_4 + SO_4 + 2H_2O = PbO_2 + 2H_2SO_4$.

When Battery Is Discharging

Action at positive plates, $PbO_2 + H_2 + H_2SO_4 = PbSO_4 + 2H_2O$.

Action at negative plates, $Pb + SO_4 = PbSO_4$.

In the above equations, $PbSO_4$ signifies lead sulphate; H_2 means hydrogen; Pb, lead; H_2SO_4, sulphuric acid; SO_4, sulphate; H_2O, water; PbO_2, lead peroxide. Obviously, as discharge progresses, more sulphate is taken from the electrolyte, leaving water. Hence the gravity goes down.

From the foregoing it will be apparent that in order for the battery to give out electrical energy, as it must do when the starter is operating or when the lights are burning, there must be pure lead on the negative plates and lead peroxide on the positives. These materials are the battery's wealth. As its electric energy is given out it must spend more and more of them until finally it can give out no more current, because it has exhausted its supply. Before it can give out any more current, some or all of this material has to be returned to the plates—the store houses.

Just as it is with a checking account at a bank, you cannot continue to pay out unless you make deposits to boost your balance. From this explanation, it is hoped the motorist will see what it means to draw more current from his battery than is put back into it. Such an unbalanced state of affairs cannot continue indefinitely, and finally the battery becomes run down.

Next week Motor Age will go into some other phases of the storage battery and its care.

Manufacturers' Communications

USING LOW-GRADE FUEL

DETROIT, Mich.—Editor Motor Age—There are three essential elements in the handling of low-grade gasoline in motor cars. First, some form of energy or system must be used to break the fuel into its finest possible state, inasmuch as the crude oils and kerosene are less volatile than gasoline and very sluggish in action and must be thoroughly broken up and vaporized. Second, sufficient constant heat must be applied to bring this grade of fuel to a combustible temperature in order to obtain the maximum power. Third, the carbureter, or mixing valve, must be so designed that it will not be affected in its operation by this excessive heat, which is necessary to vaporize the fuel. Most carbureter manufacturers nowadays are eliminating springs from their carbureters, owing to the fact that the tension is weakened under these heat conditions and obviously are unreliable.

Something like 2,500 trucks are in use on the Pacific coast burning distillate, which is only a little better grade of fuel than kerosene, having a gravity test of 49 to 51. These have been in operation for 3 to 4 years, using a stock type of motor and carbureter, and their success is beyond question of a doubt. It is just a matter of truck users becoming familiar with this system when they will burn 7 or 8-cent fuel elsewhere the same as they do in parts of Indiana and California.

Another important feature is to have a dash control to regulate the mixture so that a very rare or the lightest possible mixture can be obtained to eliminate the carbon deposits and soot characteristic of kerosene. When this is handled properly hundreds of trucks have been known to go 8,000 to 10,000 miles before grinding of the valves is necessary. The difference in power between the present low-grade gasoline and distillate is hardly perceptible, except a little sluggishness at low engine speeds. Two tanks, however, are usually used, one for gasoline and one for distillate or whatever form of fuel might be used. After the gasoline is used to start the motor, then immediately switch on the low-grade fuel tank. With this system hundreds of dollars can be saved in fuel, and when the public realizes the efficient results that can be obtained the price of kerosene and gasoline will be more nearly equalized. I have talked to a great many truck manufacturers and there is no question but what some of the truck concerns soon will be putting out trucks with equipment capable of successfully handling this fuel. Hundreds of private truck owners are equipping their trucks in this way and the high cost of gasoline is forcing the issue.—A. B. Walton, Sales Manager, Master Carbureter Corporation.

TIRES AND CENTRIFUGAL FORCE

Akron, O.—Editor Motor Age—There is a new factor in tire wear—centrifugal force. You need not start worrying, Mr. Car-owner; at the maddest rate of speed the authorities or your good judgment will permit your taking your good car, this formidable sounding force won't add a cent to your car-upkeep. Over the big speedways, however, it has demonstrated itself unmistakably. It will be remembered that up to this year such terrific speeds as have characterized the Indianapolis and Chicago classics have not been possible. Engines would not allow it and, above all, tires could not stand up under the strain. Just about so far at just about such a speed and bang! would go the tire, often causing serious accidents and occasionally death to driver or mechanician. But since the drivers at the big races this year, practically in a body, have turned to the cord tires, not only has much greater speed been attained, but better tire service has resulted, new nonstop records have been set, and accidents have been cut down materially.

But with this new adjustment of things comes a new factor that is being carefully watched by Goodrich experts, and that is, centrifugal force. This force is, as most of us know, the tendency of a whirling body to project itself off into space at a tangent. It is just like whirling an apple tied to a string, around your head. There is a continued pulling by the apple—it seems to want to shoot off into space; and, if you suddenly do let go, off it will shoot. This is centrifugal force.

It is this force which has flattened the earth at the poles. This old globe of ours whirling so rapidly bulges out at the equator with that tendency to fly off into space—just as Saturn threw off its rings. Now at Indianapolis and Chicago, Sheepshead Bay and elsewhere, the tires were revolved so much faster than speeds known in the past, that centrifugal force came into play and contracted the sides thereby reducing the tire width and increasing the circumference at the tread. Not noticeable, understand, while in the running, but the flattening tendency was realized to such an extent that when the tires were removed from the rims it was found that, of the three ribs forming the tread of the Silvertown, the center one was worn while the two outer ones were almost intact. And all have the same point of contact in normal usage, mind you. At first this peculiar spectacle of a sort of grooved wearing of the tire was a puzzler but the Goodrich experts soon found that centrifugal force was the culprit, flattening the tire sides until the center rib projected out far enough to get this extra wear.—E. C. Tibbetts, Advertising Manager, B. F. Goodrich Co.

Lozier Brings Out Another Six; a Seven-Passenger at $1,875

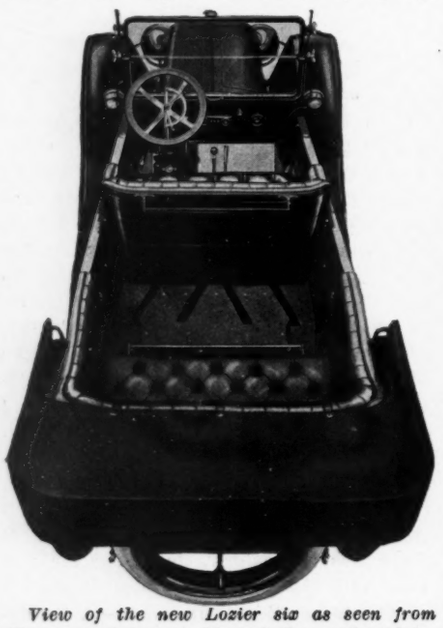
New Design Is Somewhat Smaller Than Its Predecessor and the Price Is $1,375 Less

The new seven-passenger Lozier six, which sells for $1,875

ADDITION has been made to the line of the Lozier Motor Co., Detroit, Mich., in the form of a new six which brings the Lozier family for 1916 up to a total of three—one four and two sixes. The new six is somewhat smaller than the previous six announced in December, the former having a 3⅞ by 6 motor while the new six has a bore of 3½ inches and a stroke of 5¼. In comparing the two sixes, a wide difference in price is noticed, the new car listing at $1,875 while its companion sells for $3,250 as a seven passenger.

The cylinders are of grey iron, block cast, L-head type with the water jacket and the upper half of the crankcase cast integral. Ample clearance is provided around the valves which are of steel. The ends of the stems are hardened to insure against wear of tappet action and are fitted with oil tempered springs. The valve stem locking device is of a patented design, said to be simple and readily detached. Marked accessibility for adjustment of valves is found in the removable side plates covering them. Removal of these plates exposes the valve and tappets. Valve lifters are of the mushroom type with the heads and stems ground to size and operated directly from the cams.

The new six is equipped with a Gray & Davis two-unit starting, lighting and ignition system, the generator and ignition distributor being combined. Lubrication is accomplished by a combination of force feed and splash, a horizontal plunger pump driven by an eccentric on the camshaft forcing oil through copper tubes directly to the timing gears and all main crank and camshaft bearings. It then drains back into the oil pan; thus maintaining a level for the splash lubrication of pistons and connecting rods. Provision is made for draining the oil and the removal of the strainer for cleaning.



View of the new Lozier six as seen from the rear, giving an idea of the cowl and instrument board

Multible Disk Clutch.

The clutch is of the multiple disk type housed in the engine flywheel, alternate disks being faced with a fabric of asbestos and metallic wire woven together. The gearset is of the selective type in unit with the motor and offering three speeds forward and one reverse. The floating rear axle is fitted with spiral bevel gears and the propeller shaft transmits power to the rear axle through a universal at each end of the shaft. The rear springs are of the platform type.

A hot air pocket between the cylinders heats the carbureter and the fuel is fed from a 20-gallon gasoline tank suspended in the rear through the Stewart vacuum system to the carbureter. Cooling is attained by centrifugal pump. This pump is provided with two extra large bearings fitted with stuffing boxes and equipped with a drain cock so that the water can be drawn off in cold weather.

Both internal expanding and external contracting brakes are found on the new six. The steering wheel is on the left and control in the center, the control lever being of the ball type. The foot brake and clutch pedal are arranged on either side of the steering column while the accelerator pedal is just to the right of the foot brake pedal.

The wheelbase is 120 inches and the actual horsepower is said to be 50, while the average gasoline consumption is said to be 1 gallon every 15 miles. The new six is fitted with straight-side demountable rims and tires measuring 36 by 4½. The battery used is a Willard, 100-ampere hour.

The seven-passenger body follows the conventional streamline design which Lozier claims to have been the first to inaugurate in this country. Two auxiliary disappearing seats are provided and the upholstering and cushions are of leather equipped with springs and filled with high-grade hair. Equipment is rather complete and includes ventilating windshield, a top that may be raised or lowered by a person standing in the tonneau.

E. V. A. TO JOIN LIGHT BODY

New York, Feb. 25—At the meeting of the executive committee of the Electric Vehicle Association of America, it was formally announced that the Electric Vehicle Association would affiliate with the National Electric Light Association, some time in March.

In so doing it will discontinue its identity as an association and will become the Electric Vehicle Section of the N. E. L. A. It is the present intention of discontinuing any further meetings of the body, the members of the E. V. A. attending the regular monthly meetings of the N. E. L. A.

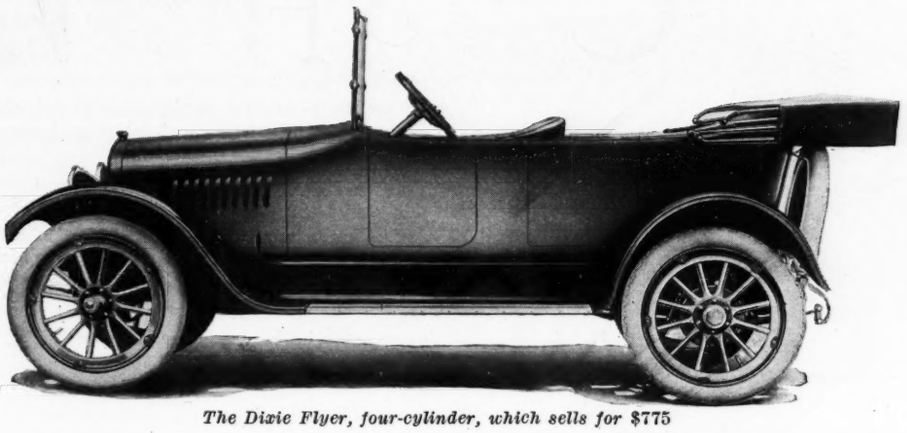
In the new arrangement the E. V. A. organization is retained intact, the president becoming chairman of the new section and other officers retaining their titles as of the section. The present E. V. A. office will be continued. The membership of the E. V. A. will become full members of the N. E. L. A., assigned to the Electric Vehicle Section.

It is thought that the combination of the two bodies will be a strengthening move to both organizations. The primary object of the E. V. A., when formed was to promote the co-operation of the central stations in boosting the electric vehicle. The N. E. L. A. has in its membership a majority of the 6,000 in this country.

A general meeting of the E. V. A. will be held on March 10 when the membership will be given an opportunity to vote on the question.

New Dixie Flyer Latest Product of the Blue-Grass State

Makes Its Bow at Louisville Show—Has Novel Radiator Mounting



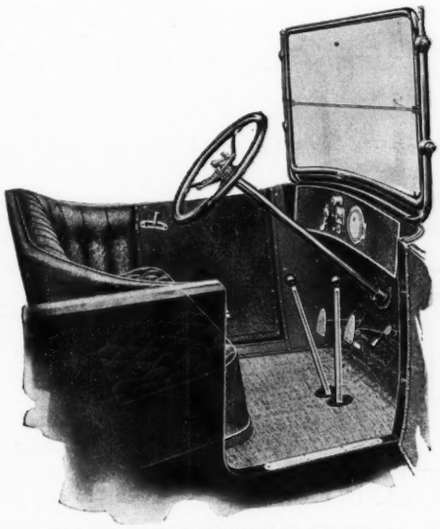
The Dixie Flyer, four-cylinder, which sells for $775

THE Louisville show marked the first public appearance of the Dixie flyer, made by the Dixie Motor Car Co., Louisville, Ky. The Dixie flyer has a four-cylinder unit power plant with floating rear axle, 112-inch wheelbase, uses the Dyneto electric system of starting and lighting. Dual exhaust eliminates back pressure on the motor. The body is streamline of the yacht type, finished in bottle green, the high-crowned fenders and radiators are black enameled and wheels are finished in a light natural wood stain. The interior appointment is carried almost to the point of luxury, appealing to every sense of the lover of comfort and elegance.

Car Is Well-Found

The instrument board is covered with buffed leather and outlined with raised aluminum binding, the interior of the doors are covered with the same heavy grade of upholstering material as the cushions, and the floors and toe board are covered with deep-piled carpet of a tan-olive shade, blending into the general color scheme.

The Dixie flyer is furnished with complete equipment, including one-man top, quick detachable side curtains, etc., and a full complement of tools. The car sells for $775.



Showing room in driver's compartment

Roadster bodies for the standard chassis have not yet been sufficiently developed to be exhibited at the show. Announcement is made that it would follow the general streamline of the touring body and accommodate three persons.

A noticeable improvement is the extension on the right side of the brake pedal. This extension engages the heel of the driver's shoe and makes it unnecessary to remove the foot from the brake pedal when operating the accelerator. It is pointed out by the Dixie concern that this is a big detail in the direction of "Safety First" since the first involuntary movement of the driver when suddenly confronted with danger ahead is to push forward with both feet. Such a movement in the Dixie flyer, even though directed by fear, automatically will relieve the clutch and set the brakes.

Kept Under Cover

Inquiry at the factory developed the fact that as long as 9 months ago every structural and mechanical detail had been officially adopted and materials sufficient for the first year's requirements contracted for.

The motor used in the Dixie Flyer is known as the Dixie-Lycoming. It is a unit power plant developing 30 horsepower and has four cylinders measuring 3¼ by 5, block-cast, with removable heads, the valves being inclosed. Lubrication is by constant splash and plunger pump, while the cooling is thermo-syphon. The clutch is a cone leather faced with six compensating plungers under leather to insure easy engagement.

A three-speed selective gearset is used, control being located in the center and drive on the left. Drive is through one universal and the propeller shaft, the torque of the rear axle being taken by specially designed fork and reach rods. The rear axle is floating mounted on roller bearings, brakes are external contracting and internal expanding, while the self-lubricating springs in the rear are three-quarter scroll elliptic. The wheelbase is 112 inches, the gasoline tank is hung at the rear of the chassis, and fuel is taken from it by the Stewart vacuum feed.

Equipment is complete, including clear-vision, rain-vision, ventilating windshield, one-man top with improved side curtains, electric lights, horn, speedometer, etc.

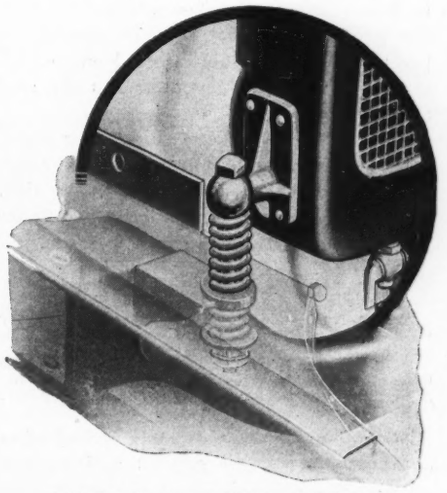
TO BUILD TIME CAR

Milwaukee, Wis., Feb. 26—The Time Manufacturing Co., Milwaukee and Oostburg, Wis., is the latest recruit to the ranks of Wisconsin motor car builders. Milwaukee and Sheboygan county interests have combined to produce a popular-priced six-cylinder touring car under the trade name Time, and by April 1 the first of a lot of 1,000 will be coming through, it is stated.

The Time company is capitalized at $150,000, two-thirds of which is paid in. The remaining $50,000 is being marketed at $1 the share. The officers are: President, L. P. Timmer, Schleisingerville, Wis.; vice-president, F. A. Tuschen, Milwaukee; secretary and treasurer, A. A. Grau, Milwaukee.

The former plant of the Oostburg Foundry & Machine Co., at Oostburg, Sheboygan County, Wis., has been purchased by the company and will serve as its plant for the present. The works inventory at $35,000 and are equipped for the purpose. The plant is situated on the main line of the Chicago & North-Western railroad.

The Time car will be built only as a five-passenger touring car, listing at $795, f.o.b. factory, Oostburg. The specifications include the following: Six-cylinder, overhead-valve motor, 30 to 35 horsepower, 3-inch bore and 4½-inch stroke and disk clutch. The wheelbase is 112 inches and wheels are 32 by 3½ inches.



Novel radiator mounting on Dixie Flyer

The Readers' Clearing House

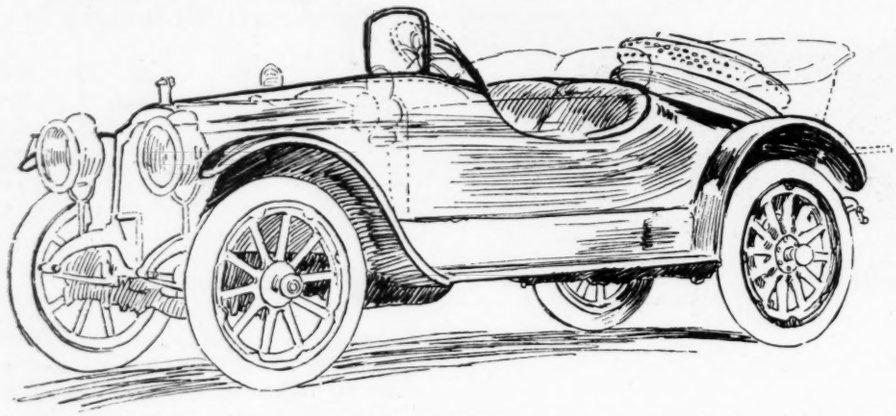


Fig. 1—A suggested transformation of a Packard 30 phaeton, making it a speedster. The dotted lines are the original

METHOD OF FIGURING GEAR RATIO

How to Determine it When Tire Size and Speed of Engine Are Known

ROCKPORT, Ky.—Editor Motor Age—How may the gear ratio of a car of given size be found?

2—Was the Overland driven by Ed Waterman at St. Louis on November 20, 1915, a stock car? If so, what model and equipment; if not, give mechanical data.—Subscriber.

1—In order to determine the gear ratio, you would have to know the speed of the engine at any particular speed of the car, and also the outside diameter of the tires. For instance, suppose you knew that when the car is travelling at 25 miles an hour the engine is running at a speed of 875 revolutions a minute. If the car had 36-inch tires, you could get the gear ratio. The procedure would be as follows: Reduce the 25 miles per hour to feet per minute, which is 2,200 feet per minute. Now the 36-inch tires are 3 feet in diameter, and we know that for each revolution of the tire a distance equal to the circumference of the tire is covered, or 9.42 feet. Dividing the speed of 2,200 feet per minute by the number of feet per revolution (9.42), we get 234 revolutions per minute of the rear wheels when the car is traveling at 25 miles per hour. Now the engine is turning at 875 revolutions per minute at the same time, hence dividing 234 into 875, we get 3.74 as the rear axle gear ratio.

2—We do not believe this was a stock car race, so this probably was not a stock car. We have no definite data on this, however, so are unable to advise you under just what conditions the race was run.

Width of Speedway Tracks

Caney, Kan.—Editor Motor Age—What is the width of the Indianapolis speedway, also Chicago?

2—What grade, gravity, of gasoline gives the best all-around service with the least trouble? Also, which is better, straight-run or blended? —E. C. Bogert.

1—Indianapolis speedway is 50 feet wide on the straightaway and 60 feet on the turns. The Chicago speedway is 60 feet on the homestretch, 50 feet on the backstretch and 70 feet wide on the turns.

2—60 to 65 Beaume. Straight run is better, but not so common nowadays.

SEVERAL HINTS ON HIGH SPEED

Wants to Convert Four Into a Faster De-Eign—Timing Directions Impossible

Elkhart, Mo.—Editor Motor Age—Having a four-cylinder motor 4 5/16-inch bore, 5-inch stroke, 1⅝-inch valve opening, horsepower rating 40, would like to have Motor Age inform me about changing cams on same so as to be able to make motor more speedy. The changes I propose to make are shown in Fig. 10.

2—Also inform me just what degree to set the valves on No. 1 piston, also best point to change the cams. The exhaust cam has 35 degrees on which the valve stands wide open, the intake has 10 degrees 45 inches at present.

3—Would Motor Age advise changing to alloy pistons or boring out the present ones to lighten up? What is the best way to drill out connecting rods for safety or strength?

4—How many rings are advisable? Would Motor Age advise leakproof for high speed? Inclosed find drawings of cams and stamp for return answer, as I would like to get busy before the next issue of Motor Age.—C. A. Larson Auto Specialties Co.

1 and 2—It is extremely difficult to state a timing arbitrarily that will work in any engine. Where a certain timing is best adapted to one particular design of engine, and at one speed, this same timing might not prove the best for another motor, even though they were of the same size. It is a mistaken idea to think that changing the timing will give more speed or power. The engineers at the factory where the car was made tested out all sorts of combinations of timing before they settled upon any one, and ordinarily their judgment in the matter should be put above the tinkering tendencies of any car owner. However, a good timing where the engine runs up to speeds around 2,000 r.p.m. is given as follows, but this timing is not the best at low speeds. It is a question whether one wants a good all-around timing or such a setting as will give speed primarily:

Intake opens 5 degrees past top center.

Intake closes 50 degrees past lower center.

Exhaust opens 50 degrees before lower center.

Exhaust closes 5 degrees past top center.

3—The old pistons would not be strong enough if bored out. You could use aluminum alloy pistons very satisfactorily, undoubtedly. It would not be advisable to drill the connecting-rods, as that would weaken them without appreciable benefit.

4—Three rings usually. Some form of anti-leak rings probably would be of great advantage.

DETAILS OF SOME ENGINE SPEEDS

What Several Well-Known Makes of Motors Develop in Horsepower

Pulaski, Ia.—Editor Motor Age—What is the maximum speed in r. p. m. of the Buick D 45 motor? Of the D 55 motor?

2—What is the maximum speed these cars will show on smooth dirt roads?

3—What is the maximum speed of the Hudson Super-Six when equipped with the 4.45 to 1 gear ratio? Please show horsepower curve of the Chalmers 6-30 motor at various r. p. m.

4—What is the maximum speed of the Franklin car and the r. p. m. the motor is turning when traveling this speed?

5—What speed is the motor of the Chalmers 6-48 capable of doing when propelling the car? —J. A. Baughman.

1—The maximum speed of the Buick D-45 motor is 2,000 revolutions a minute, and that of the D-55 is 1,750 revolutions a minute.

2—About 60 miles an hour.

3—The maximum speed of the Hudson Super-Six when equipped with 4 5/11 to 1 gear ratio is about 70 miles an hour. The power curve of the Chalmers 6-30 is shown in Fig. 9.

4—The maximum of the Franklin is

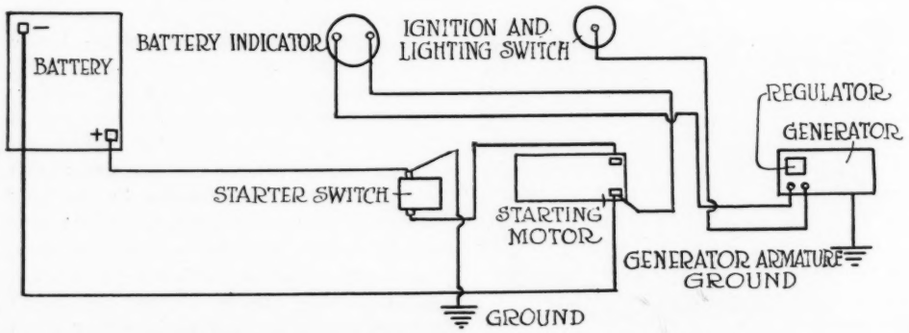


Fig. 2—Illustrating wiring connections and movement of curren in a Chalmers

about 50 miles per hour and the motor maximum is from 1,400 to 1,500 revolutions a minute.

5—The Chalmers six-48 engine has a maximum speed of 1,900 revolutions a minute.

A DISCUSSION OF THE AXLE TYPES

Pros and Cons of the Three Principle Types of Axle Construction in General Use

Belvidere, Ill.—Editor Motor Age—Kindly discuss, pro and con, floating and semi-floating axles.—F. T. Sergent.

Referring to 1 in Fig. 4, a floating axle is shown. In this kind of construction, the axle shafts have no function other than transmitting the power received through the differential. They have nothing to do with the sustaining of the load, the housing taking care of this and preventing wheel wobbling. The wheel bearings are on either side of the center line of the wheel, and any tendency to bend the axle is resisted by the housing, with no stress coming on the axle shaft, which turns freely within. The end of the driving shaft has only a driving connection with the wheel.

Now compare this axle construction with that of the three-quarter floating type, so called. This is seen in 2. Usually one bearing is used, that placed directly under the wheel. The axle tube extends into the wheel hub, but instead of merely a driving connection, as in the floating type, the axle shaft is rigidly connected to a flange, which, in turn, is firmly attached to the wheel. Thus, any bending stress placed upon the wheel is not carried by the axle housing to any great extent.

The third type, the semi-floating axle, is shown in 3. In this construction, the single bearing usually is in from the wheel center line and it works directly upon the shaft, which is fixed to the hub of the wheel. From the sketch it is evident that the shaft must carry all of the load and withstand any bending stresses. This in addition to doing the driving.

Obviously there is greater chance for wheel wobbling with the semi-floating than with either of the others, and that there is less chance in the floating than the three-quarter floating design. There are, of course, a number of modifications of these diagrammatic designs in practice, but they show the essential differences between the three types. It might be considered that the less the axle shafts are called upon to do, the greater the degree of float. Either of the designs will give satisfactory service, providing it is properly proportioned. Naturally, the housing of the floating axle must be heavier than that of either of the other two, and the shafts of the latter two must be heavier than those of the floating type, considering that all three are to carry the same load.

CHARGING CIRCUIT OF CHALMERS

Tracing the Current From Generator to Battery and Back

Willis, Mich.—Editor Motor Age—Kindly trace the charging circuit on the Chalmers 16 overhead camshaft model, which is equipped with a Gray and Davis starter and Ward Leonard regulator.—A Reader.

The charging circuit is shown in Fig. 2. The starting circuit is also shown in this diagram, because the two circuits are so related that it would be difficult to trace one without bringing in the other somewhat. Referring to this diagram you will notice that the generator armature is grounded. The current goes from the armature through this ground connection to the other grounded point which is one terminal of the starter switch. From this point the current goes to the positive terminal of the storage battery. From the negative terminal of the battery, the circuit goes to one of the terminals of the starting motor, then through the ammeter and back to the generator, thus completing the circuit.

Attacking a Packard

San Antonio, Tex.—Editor Motor Age—Kindly advise me how to redesign my 1910 five-passenger phaeton Packard 30 into a speedster. 2—Is the wheelbase too long, also the frame? 3—What new parts will be needed for this work?—Reader.

1—A suggested speedster body for this car is shown in Fig. 1. You would have to lower the steering gear.

2—Probably they could be used satisfactorily as they are.

3—Do not believe you would need any new parts unless you wished to put in aluminum pistons and place a gasoline tank at the rear of the seat.

Putting Ammeter on Regal

Wellsburg, N. D.—Editor Motor Age—Give complete instructions for connecting a Gray and Davis ammeter to a Regal small four, giving details as to size of and kind of wire, where to connect, etc.—J. F. Wilke.

Wiring diagram of the Regal small four with ammeter inserted in the line from the storage battery is shown in Fig. 3. The negative wire from the battery is grounded, and the ammeter should be inserted across the line from the positive terminal of the battery, as shown. Use the same kind of wire as the battery line, which is No. 6. Probably the easiest way would be to disconnect the battery wire from the starter switch and attach this wire to the ammeter, and then running another wire from the other terminal of the ammeter to the switch terminal.

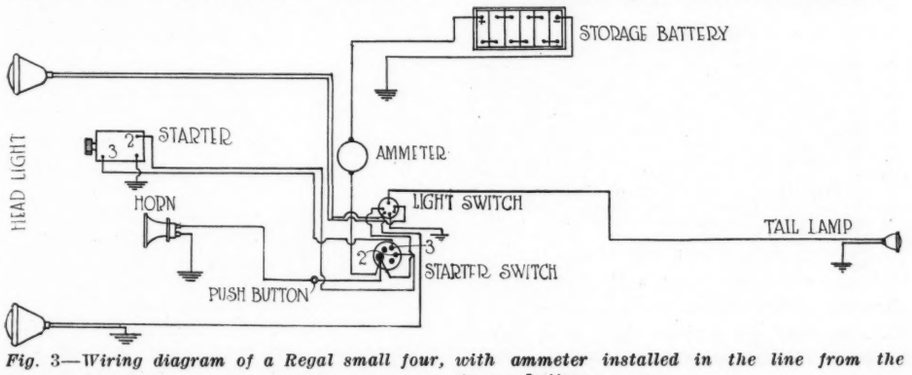


Fig. 3—Wiring diagram of a Regal small four, with ammeter installed in the line from the storage battery

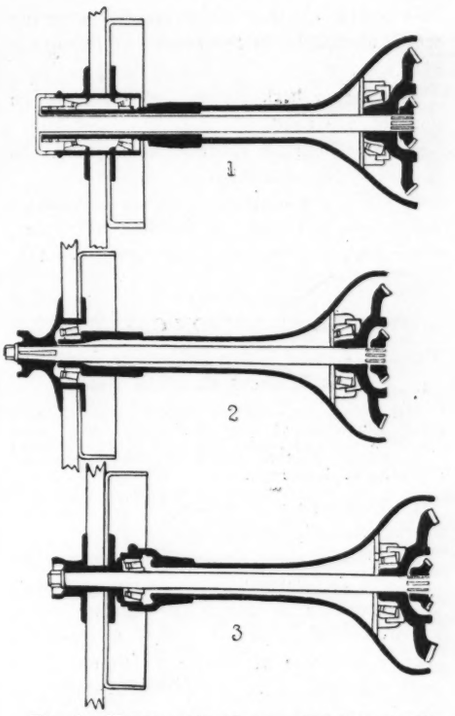


Fig. 4—Showing the three axle types—1, the floating; 2, three-quarter floating, and, 3, the semi-floating

WANTS DATA ON WESTCOTT CAR

Delco Distributer and Breaker Mechanism Described and Illustrated

Chicago—Editor Motor Age—How many gallons of water will the radiator of the Westcott car hold for the cooling system? 2—Is the motor marked on the flywheel rim for timing, and are the timing gears marked for timing? 3—Kindly furnish a diagram showing the Delco distributer and breaker mechanism; also describe the timing instructions with this unit. 4—Does this car use the Warner disk clutch and transmission gearset? If not, what make is used? 5—Describe and illustrate the adjusting nut and lock for end play in this gear. 6—Is the cantilever spring supposed to be the best type of spring?—John Connell.

1—The radiator itself holds 3½ gallons while the water jacket and pipes hold an additional 2 gallons, making the capacity of the radiator system 5½ gallons.

2—The motor is marked on the flywheel rim for timing and the timing gears also are marked for timing.

3—Diagrams of the Delco distributer and breaker are shown in Figs. 6 and 7. Timing instructions for the Westcott are as follows. When cylinder No. 1 is at the end of its upward stroke, the motor is turned so that it is in the center of No. 1 terminal in head, making sure that the circuit is broken; the breaker lever resting in center of the distributer contact breaker cam.

The spark control lever on the steering wheel should be in the center of the quadrant.

4—Warner disk clutch and transmission gearset are used.

5—The bearing retainer is adjusted to take care of end play.

6—This is a matter on which authorities differ. It is largely a question of choice, some makers preferring one type and others another.

ADJUSTING TILLOTSON CARBURETER

Turning Needle Valve Adjusting Screw to Right Reduces Gasoline Feed

Mt. Etna, Ia.—Editor Motor Age—Kindly publish a sectional view of the carbureter used on the Overland model 83, and Willys-Knight?
2—Kindly explain how this carbureter is adjusted.—V. Westrope.

1—This was a Tillotson Model A and a section view in shown in Fig. 5.

2—The Tillotson Model A carbureter has but one adjustment, viz.: the primary nozzle, which is provided with a needle valve adjusting screw. This adjustment should be made after the motor has been well warmed up and while the engine is running about 400 or 500 r.p.m. Turning the needle valve adjusting screw to the right or up reduces the amount of gasoline supplied, and turning to the left or down increases the amount of gasoline supplied.

The increased amount of both air and gasoline is supplied by a secondary nozzle and an auxiliary air valve. The auxiliary air valve is a flat reed of special material and design, the tension of which is predetermined and not provided with an adjustment. The correct position of the reed is lying flat on its seat and should be perfectly flat, so that the clamp screw which holds it in place does not force the reed to hug its seat.

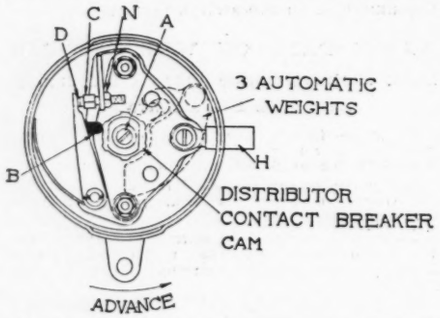


Fig. 6—Breaker mechanism on the Westcott

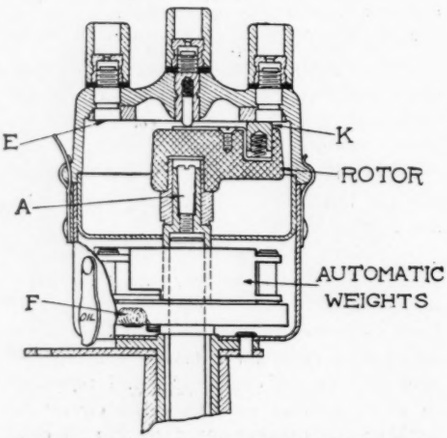


Fig. 7—Cross-section of the Delco distributer on the Westcott

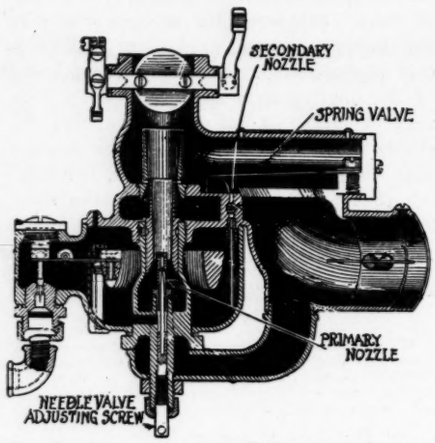


Fig. 5—Cross-section of Tillotson carbureter, showing adjustment

The auxiliary gasoline supplying nozzle is located underneath and outside of the auxiliary air valve, therefore no gasoline is drawn through the secondary nozzle until the motor has reached sufficient speed to raise the reed valve off its seat, and then the velocity of air passing through the auxiliary air valve draws gasoline from the secondary nozzle. This automatically gives the required amount of gasoline from the secondary nozzle in proportion to the air velocity.

The auxiliary nozzle is designed in the form of a valve, to be either opened or closed. The valve is located just above the float chamber and is provided with a lever, which, when pointing up in a vertical position, the valve is opened; when turned to the right in a horizontal position, it is closed. The only time when the carbureter should be operated with the secondary nozzle closed would be in the extreme heat of the summer, when the car is operated on boulevards, level streets and good roads, where maximum power and speed is not required, and under these conditions the operator can dispense with the secondary nozzle and materially increase his mileage; under any other condition the secondary nozzle always should be open.

WIRING DIAGRAM OF A SPLITDORF

Indicating the Connections Between Type T Magneto, Transformer and Switch

Alberta, Can.—Editor Motor Age—Evidently Motor Age did not understand my query, published on page 29, issue December 16, concerning a diagram of the type T Splitdorf magneto. What I want to know is, how the wiring of a Splitdorf magneto is connected to the internal windings of the transformer coil having six contacts, and how the five-point switch having a push button is connected to the internal windings of the same coil. Motor Age will understand that it also should show how the push button is connected to the internal windings when one closes the circuit.—A. M. C.

While it is difficult for Motor Age to determine exactly what sort of a wiring diagram you require, we are showing in Fig. 8 what we believe you have reference to. Your query was referred to the Splitdorf company, and their solution agrees with Motor Age's as to what you mean. If we are still not giving you the required information, write us again and try to make it clearer. The diagram shows the connections between the Splitdorf model T magneto and a tube transformer, as well as a switch with five contacts and a push button.

FLEXIBILITY OF KNIGHT MOTORS

Reader Wants to Know How It Compares with Poppet-Valve Type

Chicago—Editor Motor Age—Has de Palma's Mercedes a Knight motor? If not, what kind of a motor?
2—Has a Knight motor ever been used in a car in any of the principal races in this country?
3—Is a four-cylinder Knight motor as flexible as a six-cylinder motor of the poppet valve type?
4—Does Motor Age think the six-cylinder motor will be abandoned in time for four-cylinder types?—H. F. H.

1—De Palma's Mercedes is not a Knight motor. It is an overhead valve motor.

2—The Knight motor was used on the Mercedes-Knight driven by Pilette in the Indianapolis race of 1913.

3—Assuming a six-cylinder poppet valve motor is as well constructed as the four-cylinder Knight it will be as flexible or more so than the four-cylinder Knight.

4—No.

NON-LEAKING PISTONS FOR FORD

Reader Tells How He Changed Pistons to Good Advantage

Dover, Ill.—Editor Motor Age—While visiting a friend the other day, he gave me several copies of Motor Age and while looking through the different numbers, I came across the article in the issue of October 28, 1915, on tuning Fords for speed. I notice that in this article, under the paragraph of Too Much Oil, Motor Age makes the statement that the only remedy is to cut down on the amount of oil used. I am not a subscriber of Motor Age, but I would like the privilege of disagreeing with you. While I am not an expert mechanic, I have had

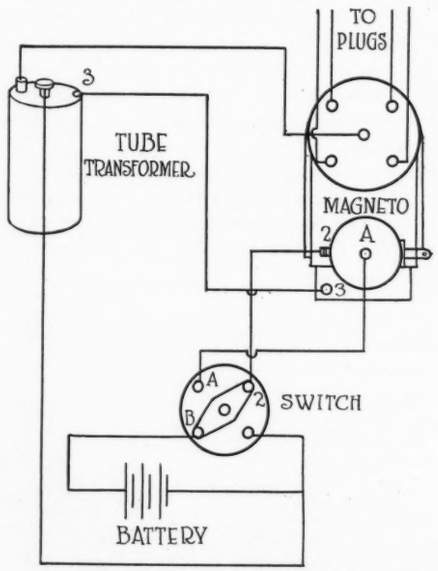


Fig. 8—Connections between model T Splitdorf magneto and tube transformer, as well as the switch with five contacts and a push button

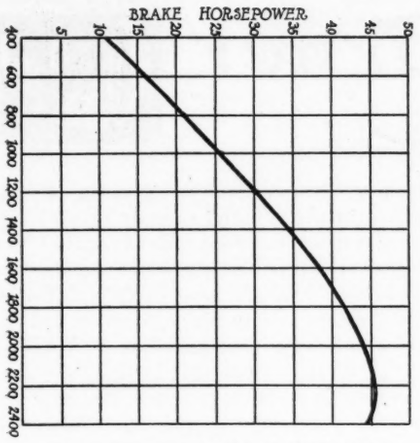


Fig. 9—Power curve in Chalmers 6-30

some experience in garage work and while at this work I and another helper discovered a remedy that has proved satisfactory as far as has been tried. The remedy consists of specially prepared pistons and have put them in two 1915 Fords with the greatest of satisfaction. Last September I bought a 1909 Ford model T touring car and when I got it, it did not seem to have much life to it. The two front pistons threw so much oil up that the best plugs that I could get could not spark. I tore this engine down and put two of the prepared pistons in the front cylinders and now they work so fine that there is nothing in the line of Fords that can go by me and some that are not Fords cannot either. They work so well that I am going to take the motor down again and put in the remaining two back cylinders with these prepared pistons. Now I am not going to describe the difference between these pistons and the common pistons as put in by the Ford company, but will say, that I will guarantee these pistons to stop the oil from fouling the plugs if rings are given a chance to seat themselves thoroughly.—Charles Taylor.

ECONOMY OF FOURS AND SIXES

Difference Is Small if Engines Are of Same Power

Raymond, Kan.—Editor Motor Age—What is considered the more economical engine, the four or the six-cylinder?

2—In engines of the same rated horsepower, pulling the same load, which requires the more gasoline, a four or a six?

3—As regards the durability and repairs, which will last longer and which will require more repairs?—Marion A. Demint.

1-2-3—There is little if any difference in the economy between a four and a six, assuming the engines are of the same power. As to the durability and need of repairs, there is little if any difference.

Timing Chevrolet Motor

Cherokee, Ia.—Editor Motor Age—Kindly publish instructions for correctly timing the valves of a 1914 model H-2 Chevrolet. The flywheel is not marked. The correct timing for ordinary use is what I desire.—A Reader.

The crankshaft and camshaft gears are both marked with punch when in proper position. To reassemble motor and assure proper timing it is necessary to turn flywheel so that marks (1) and (4) are at the top and then bring the punch marks on the gears together. In this position the exhaust valve has just closed and the intake about to open in cylinder No. 1 (front cylinder). We might state that the firing order is 1-2-4-3.

SPEEDING UP A 1916 PREMIER

Wants to Install Extra Plugs to Improve Ignition

Ferrysburg, Mich.—Editor Motor Age—I have a 1916 Premier 6-50 roadster equipped with a six-cylinder Herschell-Spillman T-head 4 by 5½ motor. This motor has a Remy ignition system. Would I get any appreciable amount of increase in gasoline economy, also power and speed, by equipping the motor with an extra set of special spark plugs, such as those advertised for use in series with regular plugs?

2—Would there be more advantage gained by putting in a special magneto for firing two plugs simultaneously? What are the relative merits of each?—J. H. Johnston.

1—It is to be expected that you will notice an appreciable increase in economy, power and speed by installing an extra set of spark plugs, as suggested.

2—Of course you probably will obtain still better results by the use of a special

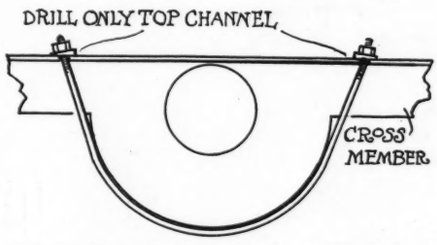


Fig. 11—How reader remedied persistent knock in an E. M. F.

magneto for double ignition but there will be a distinct improvement if the special two-point plugs are used.

SEEKS DATA ON MERCER ENGINE

This Information Is Not Made Public—Valve Sizes Given

Bay City, Mich.—Editor Motor Age—In the December 2 issue of Motor Age there was published the timing arrangement of the Knight and average motors. How does this compare with the long-stroke motor, such as the 3¾ by 6¾ Mercer four-cylinder? The power developed by this motor is extra ordinary, and I would like to see the timing diagram.

2—Also what is the size of the valves and speed of the motor in the Mercer 22-70 at maximum?—M. E. Saurier.

1—The Mercer people do not care to make public such information.

Inquiries Answered and Communications Received

Subscriber	Rockport, Ky.
E. C. Egbert	Caney, Kan.
C. A. Larson	Elkhart, Mo.
J. A. Baughman	Pulaski, Ia.
F. T. Sergent	Belvidere, Ill.
A Reader	Willis, Mich.
Reader	San Antonio, Tex.
J. F. Wilke	Wellsburg, N. D.
John Connell	Chicago
A. M. C.	Alberta, Can.
V. Westrope	Mt. Etna, Ia.
R. M. S.	Beasley, Ark.
H. F. H.	Chicago
M. A. Demint	Raymond, Kan.
M. E. Saurier	Bay City, Mich.
J. H. Johnston	Ferrysburg, Mich.
A Reader	Cherokee, Ia.
Charles Taylor	Dover, Ill.
A. L. Bennett	Charlotte, Mich.
The Walker Auto Co.	Logan, Kan.

No communications not signed with the inquirer's full name and address will be answered in this department.

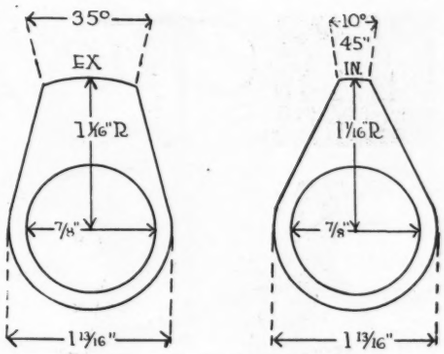


Fig. 10—Proposed changes in cam contour as designed by inquirer

2—The size of the valve is 2¼ inches and the maximum speed of the motor is 3,500 r. p. m.

KANSAS CITY A DEALERS' SHOW

Kansan Thinks More Space Should Have Been Given It

Logan, Kan.—Editor Motor Age—Why does Motor Age give the Kansas City show, America's biggest and best motor show, a scant column description, when it gave Chicago and New York a special edition? The dealers in the west resent such partiality and will manifest such resentment by transferring their subscriptions to a journal printed in the west. You should know that the Kansas City show was the biggest event of its kind in the United States, and yet you pass it by with a bare mention. Why such partiality?—The Walker Auto Co.

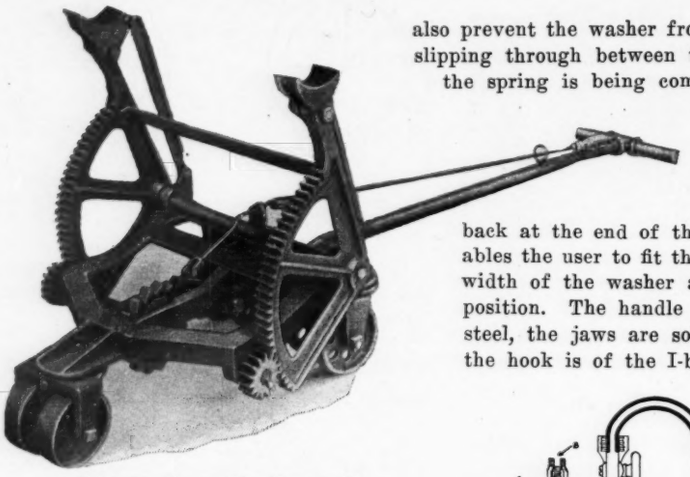
Motor Age refers you to pages 22, 23 and 24 of the issue referred to, all of which are based on the Kansas City show and deal with trade conditions in the Kansas City territory. Figures do not bear out your statement that the Kansas City was the biggest event of its kind in the country. Attendance at the Kansas City show was given as 125,000. Comparing this with New York show we find it one-half the attendance registered at the Grand Central Palace. Compared with Chicago it is slightly over one-third the attendance of 350,000 at the Coliseum.

There are only two national shows, those at New York and Chicago, and staged by the manufacturers themselves. All of the others, including Kansas City show, are dealers' exhibitions. Even were any of the later shows, such as Kansas City, Minneapolis, Louisville, or Boston, as large in point of attendance as the New York and Chicago shows, there would be no reason for devoting the same amount of space to them because it is at the two national shows that the new models, for the coming season, make their initial appearance in a body.

Remedying E. M. F. Knock

Charlotte, Mich.—Editor Motor Age—Have read numerous ideas on how to fix that heavy knock in front end of E. M. F., but here is a way that will fix it forever, as I never had one come back on me yet. A piece of ⅜-inch cold roll steel about 30 inches long bent in the shape of a big U and thread each end then drill a ⅜ hole through front motor support at each side of motor as per diagram, then insert ⅜ rod and draw up with nuts and you will find the knock gone.—A. L. Bennett.

The Accessory Corner



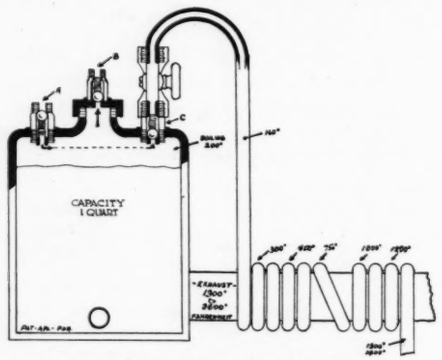
The Brunk combination jack

Brunk Combination Jack

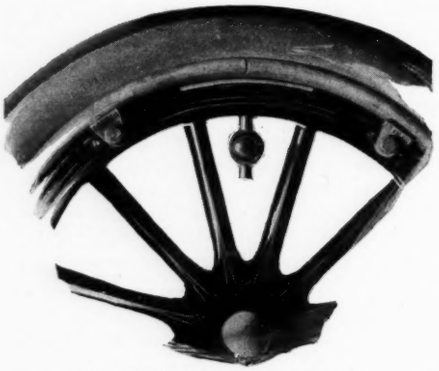
A JACK that can be used for lifting, transporting, as a turn table or a tire rest, is found in the Brunk combination jack, made by the Brunk Mfg. Co., St. Louis, Mo. This jack permits the raising of a car 12 inches from the ground, and is designed to eliminate the necessity for a pit in the garage. It is readily placed under the front or rear axle, no matter what the obstruction on the rear of the machine. The sector arm is so constructed as to pass between the truss rods and the axle. The movable shoe on the sector is held in perfect horizontal position at all times, thus preventing the car from tipping over. The lifting device works with ease, being a direct leverage and having a simple locking device which is said to be both safe and positive. The double roller-bearing caster wheels and the way they are placed enables one to push the car in any position desired with little effort. The construction is of steel and malleable iron. It weighs 107 pounds and has a lifting capacity of 5,000 pounds. The finish is aluminum. Price, per set of two—one for each axle—$50; single, $25.

Universal Valve Lifter

In the Universal valve lifter, made by the Moody-Blackman Co., Peoria, Ill., one finds a tool that can be adjusted in width of jaws to fit the different sized washers at the lower end of all poppet valve stems. The grooves on the inner side of the jaws also prevent the washer from tipping and slipping through between the jaws while the spring is being compressed, a condition common to several types of valve lifters. The thumb-screw adjusting nut is back at the end of the handle. This enables the user to fit the jaws to the exact width of the washer after the tool is in position. The handle is made of pressed steel, the jaws are solid and strong, and the hook is of the I-beam type, which is designed to withstand heavy stresses. Price, $2.



Illustrating the oxygenerator



Tire pressure warning device

J. B. D. Resilient Wheel

The J. B. D. resilient wheel for Ford cars and trucks, made by the J. B. D. Resilient Wheel Mfg. Co., Milwaukee, Wis., is a specially-made artillery wheel of sturdy construction, with short, reinforced spokes. The resilient mechanism is contained in the hub and consists of nine circular rubber cushions placed around the hub as shown in the illustration in this department. The principal parts besides the cushions are a body flange, a driver and an adjusting ring. The cushions have given 15,000 to 20,000 miles, it is said, and can be replaced at 20 cents each. The only attention necessary is the application of graphite three or four times a year. One screw on the adjusting ring accomplishes the entire adjustment. The case containing the cushions is dust and water proof. The wheels are made for accommodating any kind of tire.

New Type of Magneto

Henry A. Ziola, Madison, Wis., a well-known inventor and designer of electrical machinery and appliances, among them an X-Ray machine now in wide use, has perfected a new type of high tension magneto for internal combustion engines and is planning to organize a $100,000 corporation to undertake its manufacture at Madison. It is stated that the new Ziola magneto has no so-called permanent magnets nor any delicate moving parts which are likely to corrode or stick. It is guaranteed for 5 years.

Fowler Search Light

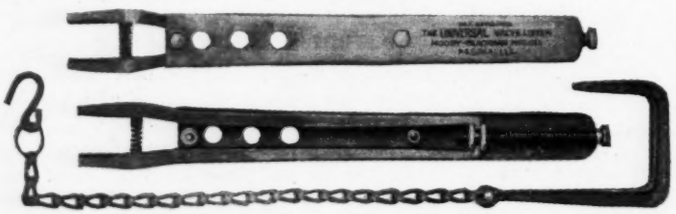
In the description of the Fowler seachlight described in the February 17 issue of Motor Age, it was said that the reflectors were nickel-plated. This should have read silver-plated.

Shelby Garage Door Holder

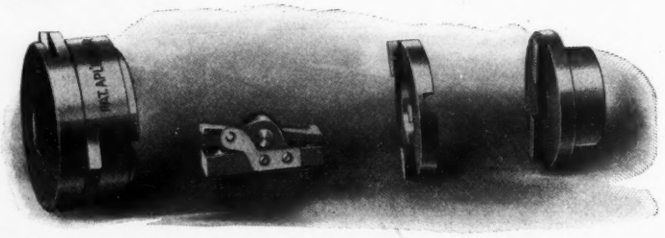
A garage door holder known as the Shelby is made by the Shelby Spring Hinge Co., Shelby, O., and is designed automatically to catch the door as it is swing ing open and hold it firmly until released by a slight pull on the chain. It also will lock the door as it is closed, the spear head of the latch entering the strike on top of the door frame. It is made of wrought steel, and there are no springs or frail parts to get out of order, or rust. All parts are heavily japanned, and installation is easy as well as the operation. They are sold at $18 a dozen.

Excelsior Bodies for Cars

The Excelsior Seat Co., Columbus, O., is making bodies for motor cars, instead of



Universal valve lifter that adjusts to fit various sizes of washers



The Swiss magneto coupling, which eliminates kicks from pre-ignition

seats, as told in the February 3 issue of Motor Age. This concern has made seats and bodies for horse-drawn vehicles for several years, but now has decided to make bodies for motor cars also.

Oxygenerator

Brief mention was made of the oxygenerator in a recent issue of Motor Age, but by reason of its brevity further mention is made at this time. The illustration shown on the preceding page gives a good idea of how this device works. It consists of a one-quart aluminum container leading from which is a copper tube coiled around the exhaust pipe and entering the intake manifold. Boiling water from the container passes through the copper coil, is super-heated to a temperature of 1,200 degrees, after which it passes into the manifold. The device is said to adjust itself to all air and climatic conditions. The price is $10.

Swiss Coupling

The Swiss Magneto Co., 3021 South Michigan avenue, is marketing a safety starting coupling which is designed to take the place of any style of coupling connecting the magneto direct to the shaft that drives it. The illustration in this department shows the various parts of this coupling. It is said that pre-ignition kicks in cranking are eliminated by the use of this coupling.

Tire Pressure Warning Device

C. E. Johnson, Grand Rapids, Mich., has invented a simple device designed to be attached to the standard valve stem of any pneumatic tire and automatically to warn the car driver when the air pressure in the tire falls 15 pounds below the initial pressure. The warning is in the form of a whistle and at every further reduction of three pounds the whistle sounds. It is not a continual whistle that is given but only of sufficient duration to be heard by the driver.

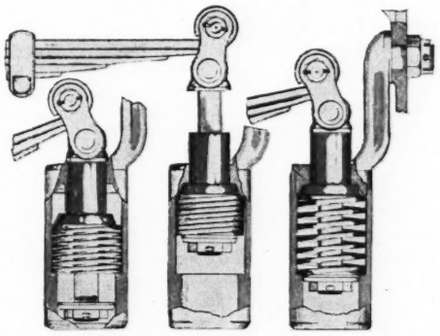
Schultz Tire Tool

A tire tool that is adjustable to fit any split rim either straight, side or clincher is being manufactured by the Schultz Machine Shop, Chenoa, Ill. By the mere removing of a thumb nut in the center of the cross member, the tool may be adjusted to fit any rim of from 30 to 36 inches in diameter. It works on the eccentric principle and sells for $2.50.

Schultz tire tool

Safety Specialties

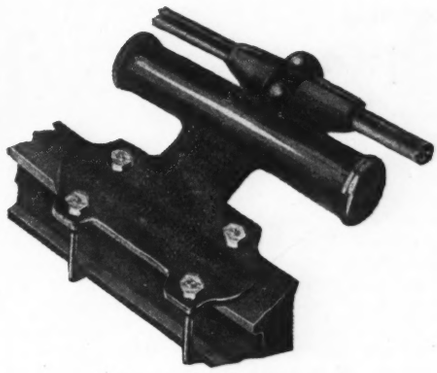
The Safety Mfg. Co., Quincy, Ill., makes a number of specialties among them being a safety pilot designated The Miller. This is especially adapted for use on Ford cars. It bolts to the center of the front axle with clips and connects by means of a clamp to the tire rod. Two-cylinders are provided, one within the other, inclosing a single spring to which is attached a button at either end. The action of this spring between the axle and the tire rod is to keep the wheels straight ahead at all times unless deflected by the driver.



The Bayne rebound shock absorber, showing normal, downward and rebound positions

Another device made by this company is the Wayne rebound shock absorber; like the safety pilot it is designed for use on Ford cars. Reference to the illustration on this page will show this shock absorber in three positions. The one on the left shows normal, the middle one illustrates the extreme downward thrust while the one on the right illustrates the action of the spring in cushioning the upward thrust.

A third accessory made by this company



Miller safety steering pilot

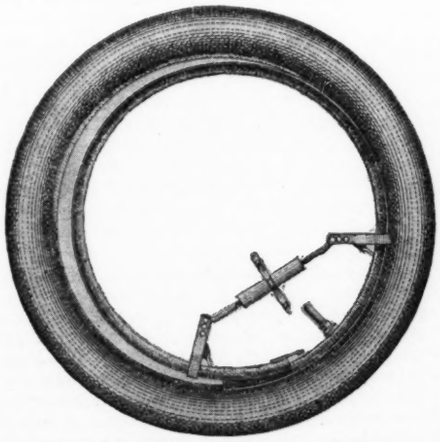
is an instantaneous demountable rim bolt. These bolts replace the old bolts and employ a high tension spring on the inside of the wheel and a special lug on the outside. Bolts are self centering and are said to eliminate rim creak. The tire is released by one-half turn of the bolts and the reverse of this operation fastens the tire back on the wheel.

Niswander Rim Remover

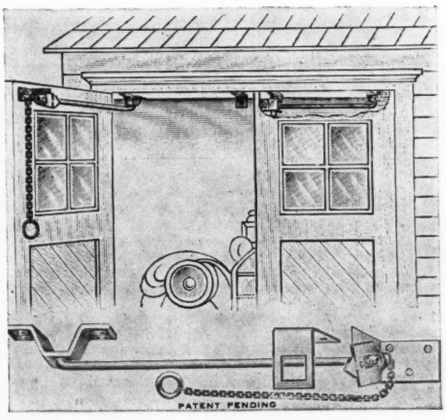
The Niswander Mfg. Co., Quincy, Ill., has a demountable rim remover in which the contracting and expanding is done by a threaded hand wheel giving an even and steady pull and contracting the rim anywhere from 1 to 4 inches. The rim hooks together with the braces are so constructed that the harder the pull the tighter they grip the rim. The device sells for $3.

Sight Feed Oiler

The Perkins Mfg. Co., Des Moines, Ia., is marketing a sightfeed oiler for drivers of Ford cars. This oiler is designed to feed an adequate amount of oil every minute the engine runs. The speed of the engine determines the amount of oil fed. The connection to the bottom of the flywheel case gives a substantial supply of oil. Oil is drawn from the supply tank and also from the bottom of the crankcase, this latter acting as a reserve supply, which can be drawn upon when needed. The sight feed on the dash gives a check on oiling at all times and keeps the car operator informed as to the feeding, since all oil passes this point on its way to the cylinders.



Niswander demountable rim remover



Shelby garage door holder

J. B. D. resilient wheel

From the Four Winds

RACINE Plans Municipal Garage—Racine, Wis., has decided to establish a municipal garage and repairshop and to remodel a fire engine house on Fourth street for this purpose. The quarters are made available by the general motorization of the Racine fire department. About $7,500 will be invested in remodeling and for equipment.

Cars Given New Names—The Russell Electric Co., Tucson, Ariz., has adopted a system of naming all its cars. It first bought a truck which was christened "O. Henry." Then a Ford was purchased and the appellation of "Tin Lizzie" was attached thereto. A second Ford was named "Irene." Manager Frank Russell says that he is going to order a new car every time that he thinks of an appropriate name.

Graduated Car Taxes—County Auditor Zangerle of Cuyahoga county, O., has arranged, after a series of conferences with the officials of the Cleveland Automobile Club, to list cars for taxation purposes on the following basis: 1916 cars purchased after January 1, 1916, 99 per cent of list price; 1916 cars purchased previous to January 1, 1916, 80 per cent of list price; 1915 cars, 50 per cent of list price; 1914 cars, 40 per cent of list price; 1913 cars, 30 per cent of list price; 1912 cars, 20 per cent of list price, and 1911 cars, 10 per cent of list price.

Dimmers for Moline, Ill.—City officers of Rock Island, Moline, and Davenport met last week in Moline, Ill., to examine various styles of headlight dimmers. A committee representing the Tri-City Automobile Trade Association also was in attendance. Rock Island and Davenport have identical dimmer ordinances, while Moline has none, but will adopt one similar to those of the other cities at once, thus insuring uniformity. A school of instruction and demonstration was held in a darkened room of the city hall building and those dimmers thought to give the best satisfaction and meeting with the requirements of the city and public were approved.

Nebraska Registration Increase—A gain of more than 45 per cent in the number of cars owned in Nebraska at the close of the year 1915 as compared with the previous year's reports is disclosed by the annual statistics compiled by the secretary of state. Nineteen fourteen closed with 40,598 cars owned in the state, while on December 31, 1915, the number of cars owned was 59,140. Douglas county, in which Omaha is located, led the list with a registry of 5,496. Lancaster county, including Lincoln, the state capital, gave a total of 3,625. Seventeen counties of the state passed the 1,000 mark, where during the previous year there had been but four such.

Milwaukee Jitneys Hurt Railway—The jitney bus took 6,000,000 fares away from the Milwaukee Electric Railway & Light Co.'s city lines during 1915, according to the annual report of the company, made public February 17. In spite of the loss of passengers, the net earnings increased $27,000. The figures suggest that the jitney buses operating in Milwaukee carry 16,000 passengers per day, while the street cars carry 250,000 passengers per day. The normal traffic of the street car company in the last 4 years was from 97,000,000 to 100,000,000 passengers annually, but in 1915 only 91,000,000 were carried. The actual loss in passenger revenue for 1915 was $200,000, or an average of more than $550 a day. The $27,000 increase in net earnings is due to increased patronage of the light, heat and power departments. It is estimated that the average number of jitney buses operating in 1915 was 375.

Horse Loses More Ground—The last hack has vanished from the streets of Bridgeton, N. J., by the retirement of Charles R. Fort, the oldest man in the business. Mr. Fort's father bought the first hack for passenger transportation here, and the son takes way the last one after 36 years of service. He will go on a farm after unsuccessfully fighting the dozen taxicabs which now handle the passenger traffic here.

Canadian Chauffeurs Organize—Having among its objects "safety first" at all times, the improvement of roads in Quebec and the protection of car drivers from unjust legislation, a union has been formed by chauffeurs, henceforth to be known in the trades and labour council as Local 159. Many members were enrolled. Preliminary organization has been pushed so far that with the election of officers, an examining board was also appointed, which will compel all those desirous of belonging to the union to pass a test of efficiency.

Wisconsin Registration Up 100 Per Cent—An increase of more than 100 per cent in the number of licenses issued to private owners of Wisconsin is noted for January, 1916, compared with the corresponding month of 1915. Up to January 31, 28,500 licenses were issued, against 13,100 in January a year ago. On February 15 the number of licenses issued was 32,500, which figure maintains the 100 per cent increase. Applications are coming into the secretary of state's office at Madison at the rate of 275 a day, and as the season advances it is expected that more than 500 requests will be filed daily. The 1915 registration of private owners was 79,791, and it is figured that the total for 1916 will be at least 110,000.

New Canadian Customs Ruling—At the request of the eastern townships associated boards of trade, of which Sherbrooke, Que., is the centre, the customs department of Canada will give service until midnight at the ports of Rock Island, Stanhope and possibly Mansonville, which are the points at which most tourists enter and leave the eastern townships. This will do away with the annoyances which existed when customs service closed at sunset. Last year the Canadian customs department announced that tourists from the United States entering Canada could do so without bond for the duty of their cars.

Woman Claims Exemption; Upheld—Mrs. Jeannette Morrison, Oglesby, Ill., won an unusual suit against the Castendyck-Hamel Auto Co., La Salle, Ill., which will no doubt prove an object lesson to other dealers. She purchased a car last summer and then went to California for a visit. During her absence, the firm attached the car on the ground that she had left the state with no intention of returning. She recently came back, produced a schedule showing that she was the head of a family and her holdings exempt from service and secured the car. Asserting that parts of the car were not returned, she brought suit against the firm and was awarded damages of $100.

Warn Fire Insurance Agents—Wisconsin mutual fire insurance agents were warned to keep away from garage and motor car risks "until the business gets down to rock bottom," by Nathan Haessly, Theresa, Wis., in an address before the annual convention of the Wisconsin Mutual Fire Insurance Association at Fond du Lac, Wis. Mr. Haessly explained that the word "garage" was being badly abused in the insurance business, and that in Wisconsin only about 5 per cent of the buildings used to store and repair motor cars were really garages. The other 95 per cent are reconstructed buildings and barns, he said, which present a hazard to insurance agents that should be accepted only after the most serious investigation has been made.

Ohio Tag Muddle Settled—The controversy between the Ohio motor vehicle department and the state auditor over the Ohio number plate contract for 1916 has been amicably settled by the interested parties. The contract had been originally awarded to the Davies Mfg. Co., Canton, at 19¼ cents per set. It is claimed that this contract was awarded without competitive bidding according to law, and when the first bill for tags, amounting to $9,000, was presented for payment, State Auditor Donahey refused to honor it. The Davies company has sub-let the contract to a New York concern at 15 cents per set. After furnishing 102,000 sets of tags the Davies company stopped deliveries because of failure to receive payment for the first consignment.

Association Forms Salesmen's Bureau—The salesmen's bureau started by the Automobile Trades Association of Colorado, Denver, a week ago showed a membership of sixty at last night's meeting, and those in charge of the organizing campaign predict an enrollment of 200 within a few months. This estimate is based upon the showing made the first week and upon the fact that there are between 200 and 300 salesmen con-

Coming Motor Events

SHOWS

March 8-11—Davenport-Rock Island-Moline show.
March 8-11—Mason City, Ia., show.
March 9-11—Kenosha, Wis., show.
March 15-18—Trenton, N. J., show.
March 20-25—Twin Falls, Idaho, show.
March 21-25—Deadwood, S. D., show.
March 22-25—Saginaw, Mich., show.
April 10-15—Seattle, Wash., show.

CONTESTS

May 6—Sioux City, Ia., speedway race.
May 13—New York, Sheepshead Bay speedway race.
May 20—Chicago speedway amateurs' race.
*May 30—Indianapolis speedway race.
June 10—Chicago speedway race.
June 28—Des Moines, Ia., speedway race.
July 4—Minneapolis speedway race.
July 4—Sioux City speedway race.
July 4—Track meet, Couer d'Alene, Ida.
July 15—Omaha, Neb., speedway race.
August 3-5—Hillclimb, Pike's Peak, Colo.
August 5—Tacoma speedway race.
August 18-19—Elgin road race.
September 4—Indianapolis speedway race.
September 9—Des Moines, Ia., speedway race.
September 15—Indianapolis speedway race.
September 29—Track meet, Trenton, N. J.
September 30—New York, Sheepshead Bay speedway race.
October 7—Omaha speedway race.
October 14—Chicago speedway race.
October 19—Indianapolis speedway race.

* Sanctioned by A. A. A.

nected with the motor car and accessory industry in Denver. The new bureau will be affiliated with the Trades Association, but will have its own officers and separate meetings. The membership dues are $5 a year. Meetings will be held twice a month to talk over the everyday problems found in the selling department of the industry, and whenever possible factory representatives and other prominent men of the trade who happen to be in the city will be secured to give the men practical pointers on selling science.

Good Roads Activities

Pennsylvania Road Funds Distributed—Townships throughout Pennsylvania last week received from the state highway department their allowance of money for the maintenance of state-aid roads for the road year ending December 31, 1915. The amount distributed was $121,828. The districts having the roads will contribute an equal amount.

Wants Branch in Dixie—The Huntsville Chamber of Commerce, Huntsville, Ala., is organizing a movement to bring the western branch of the Dixie highway from Winchester to Huntsville, and away from Chattanooga. The failure of Rutherford county, Tenn., to purchase the turnpikes of that county is expected to aid the movement. The advocates of the Huntsville route will send a delegation to the meeting of the Dixie Highway Association March 20.

Nebraska Road-Marking Campaign—Enthusiastic responses to the statewide road-marking movement recently inaugurated by the Omaha Automobile club are being daily received at the club headquarters in Omaha, Neb. Already over thirty cities and towns in various sections of the state have been heard from, either through the local organizations or through individuals who assume the responsibility of forwarding the movement themselves.

Chicago-Elgin Concrete Road—Elgin and Chicago will be connected by an all-concrete highway within 2 years. This was announced at a conference of highway officials between the two cities. The issuance of $2,000,000 in bonds for the improvement of the highways of Cook county has been legalized by the legislature after a fight lasting 2 years and work on the construction of the roads will begin without delay. Among the first will be the Higgins road from the Chicago city limits to the Kane county line, about 1 mile east of Dundee. The road to Elgin will connect with the Higgins road at that point. The Elgin and Kane county good roads boosters will take the necessary steps to extend the road to Elgin. When the Higgins road is completed it will be known as a century trail, extending from Chicago to Aurora via Dundee and Elgin.

Protest Dixie Bee Line Marker—Fifty grizzled veterans of the Civil war, at a Lincoln birthday celebration in Danville, Ill., protested against the use of the stars and bars as an emblem in the marking of the Dixie Bee Line highway. A half dozen speeches were made, each one denouncing the resurrection of the flag of the Confederacy for such a purpose. "We shot that flag down 50 years ago," declared Elisha Coolley, "and while we are compelled to respect the boys in gray who defended it, we feel that the stars and bars no longer have any place in this united nation of ours. I believe that President Wilson was right when he said that at any time this nation might become embroiled in war. If such a thing should come to pass, America should have but one thought and but one flag." Resolutions were adopted deploring the use of the Confederate flag and suggesting that some other device be substituted not calculated to keep alive sectional feeling or the painful memories of the war of a half century ago. Copies will be sent to the promoters of the Dixie Bee Line highway.

D. A. R. to Mark Lincoln Route—Plans of the Daughters of the American Revolution to mark the Lincoln way road between Springfield and Danville are assuming definite form and the markers will be erected this year. Appropriate symbols will be placed at every cross roads, showing the trail used by the great emancipator in making the journey on horseback between the two cities while practicing his profession of attorney. The Lincoln circuit extends via Batestown, Oakwood, Champaign, Monticello and Decatur, and is one of the best known of the historic roads of Illinois.

Bowser Gives to Lincoln Highway—The S. F. Bowser Oil Tank & Pump Works, Fort Wayne, Ind., has subscribed $3,000 payable in three annual installments of $1,000 each, to the Lincoln highway foundation. This company is the first actually located on the line of the highway which has subscribed, although nineteen other companies have given like sums. H. C. Osterman, field secretary of the association, was in Fort Wayne recently, and told of the work being done by the organization. Nearly $4,000,000 were spent in 1915 in the country for the improvement of the Lincoln highway, $800,000 of the amount being expended in St. Joseph, Elkhart and Allen counties.

Chicago-St. Louis Boulevard Plans—Definite steps towards acquiring the right of way for the Chicago-St. Louis concrete boulevard were discussed at a meeting of the promoters held last week by the stockholders. All of the principal cities on the line of the highway were represented. E. A. Blaich, Galesburg, Ill., presided, and O. L. Hudson, secretary of the East St. Louis Commercial club, kept the minutes. Enough stock has been sold to warrant construction of the first lap of the road this year and contracts will be let soon for the first 10 miles. The sale of stock has been much more encouraging during the past 6 months and it is believed that the entire amount will be disposed of during the coming year.

N. P. H. A. Annual in March—The first annual meeting of the National Parks Highway Association—Red Trail—will be held in Fargo, N. D., Tuesday, March 14, beginning at 10 a. m. in the rooms of the commercial club. Routine business, election of officers, spring road work, publicity work, and arrangements for dedication of Medora bridge, are to be taken up.

Bridgeton's First Show—The first show ever held in Bridgeton, N. J., was staged in the armory of Co. K., N. G. N. J. For 3 days large crowds of visitors from surrounding towns and the rural districts thronged the building, which was well filled with cars; sixteen makes being represented. Many sales were made. The dealers will organize into a permanent association and make the show an annual event.

Springfield, Ill., Show—At a meeting of the dealers of Springfield, Ill., last week, it was voted to hold the annual show the second week of March. W. J. Block will be in charge. A dealers' organization was perfected, officers being elected as follows: President, R. Haas; vice-president, Alfred Booth; secretary, H. C. Williams; treasurer, D. U. Smith. It was voted to support the good roads movement. Teams of two men each were appointed to visit the various meetings of farmers scheduled for the year to point out the advantages of good roads to the men of the rural districts and to secure their co-operation in the adoption of a proposed bond issue to construct hard roads in Sangamon county.

With the Motor Clubs

Junction City Club Organized—The Junction City Automobile Club, Junction City, O., has been organized with a preliminary membership of thirty-eight. The officers are: Joseph M. Clark, president; Frank A. Guinsler, vice-president; D. D. Birkimer, secretary, and J. N. Klinger, treasurer.

Toledo Club Elects—Officers have been elected as follows by the Toledo Automobile Club, Toledo, O.: Dr. L. F. Towers, president; M. O. Baker, vice-president; C. C. Kilbury, secretary, and H. M. Bash, treasurer. The report of the secretary showed a highly prosperous year.

Ohio Club Elects—Judge William F. Duncan was elected president at the organization meeting of the Hancock County Automobile Club held at Findlay, O. Other officers are: Vice-president, George M. Byal; secretary, Frank M. Barnhart, and treasurer, Frank J. Collingwood.

Harrisburg Club's Annual Banquet—The annual banquet of the Harrisburg Motor Club, Harrisburg, Pa., was attended by 200 members and guests. State Highway Commissioner Cunningham and Congressman A. S. Kreidler were the speakers of the evening. Mr. Cunningham urged the co-operation between the motor clubs of the state of Pennsylvania and the state highway department. He advocated an annual appropriation of $5,000,000 for a period of 10 years, the same to be devoted to the development of the state highways rather than appropriating a lump sum of $50,000,000 for the state highway department. Following the banquet the annual meeting was held and the following officers were elected: Frank B. Bosch, president; H. W. Stubbs, first vice-president; Frank R. Downey, second vice-president; H. H. Hefkin, third vice-president; J. Clyde Myton, secretary-treasurer; board of governors for 3 years, Frank B. Wickersham, John H. Shopp and George W. Owen.

Denver Club Won't Merge—A movement has been started to draw the Denver Motor Club, Denver, Colo., into a commercial and civic consolidated body to be composed of the chamber of commerce and similar organizations. wherein the club would lose its individuality and become merely a bureau of the merged association, but the club refuses to consider any such limiting of its purposes or scope of activity as a distinctive organization for the welfare of motorists. It insists upon going ahead with its original and established lines of service unhampered, on the ground that this policy is demanded by the nature of its work, by its affiliation with the American Automobile Association, by its being distinctly not a commercial body, by its present standing in the motoring world and by the best interests of its membership, especially the large number of members residing outside of the city and state. The club has been urged by the A. A. A. to take this stand and to remain a separate and individual organization with purposes harmonizing with the general policy of the A. A. A. The club is now recognized as the leading good roads and motoring organization of the entire inter-mountain region.

Among the Makers and Dealers

SHIP TRUCKS ON FLAT CARS—The invention which is mothered by necessity is exemplified in the accompanying illustrations, showing to what means motor manufacturers have had to resort to during the present shortage of railroad cars. Packard motor trucks under ordinary circumstances, are loaded into box cars for their journeys to purchasers. Because of the scarcity of rolling stock, they are given specially constructed berths on flat cars. The trucks are driven from the factory to the loading yard under their own power and run up long skids on to the cars. There they are landed on a special timber platform and, with wheels removed, are built into a waterproof shipping case, of which the platform forms the bottom. The line of poles between the two long rows of cars carries a string of electric lamps. So insistent is the demand that carpenters must work day and night and this special lighting provision became necessary. It will be seen that some of the shipments are destined abroad.

HANSON Goes to Service—A. B. Hanson, formerly manager of the service department of the Chalmers Motor Co., Detroit, recently became general manager of the Service Motor Truck Co., Wabash, Ind.

Anderson Branch at Milwaukee—The Anderson Electric Car Co., Detroit, Mich., has established a direct factory branch at Milwaukee, Wis., in charge of Jean A. Crandall. Headquarters have been opened at 604 Downer avenue. Mr. Crandall was formerly associated with the Detroit electric branch in Chicago.

Rayfield Motor Defunct—The Rayfield Motor Car Co., Chrisman, Ill., now is defunct. The entire belongings were sold at auction under decree of the federal court. The machinery and office fixtures were distributed among St. Louis, Indianapolis and Chrisman buyers, the amount realized aggregating $14,000. F. K. Thayer, Chrisman, purchased the building for $2,500. No bids were received when the plant was put up as a whole and it was necessary to sell each portion separately.

Ford Community at Milwaukee—A Ford community is being built around the new Ford branch plant at Milwaukee, Wis. The latest addition is a banking institution, known as the East Side Bank, which is incorporated with $25,000 capital, and will open about March 10 at Farwell and North avenues, a block from the Ford works. The bank will cater to employes and will be in charge of Richard Kiel, as cashier. The J. J. Dougherty Co., accessories and supplies, which has its principal store at 803 Grand avenue, Milwaukee, around the corner from the former Ford branch at 143-149 Eighth street, has established a Ford supply branch at 398 Kenilworth place, opposite the new Ford plant.

Directs Packard Aeroplane Motors—William R. McCulla, Detroit, Mich., who recently again became a member of the engineering department of the Packard Motor Car Co., has been placed in charge of the aeroplane motor division.

Lighter Acme Truck—The Cadillac Auto Truck Co., Cadillac, Mich., will begin deliveries May 1 on its new 1-ton model. The new truck will resemble the 2-ton in appearance and will be priced at $1,290. It has a 3½ by 5 Continental engine incorporated in a unit with a Warner dry-disk clutch and three-speed gearset, driving through a Timken worm-driven rear axle. It will have a Rayfield carbureter, Eisemann fixed-spark single ignition and a Pierce governor set at 22 miles per hour maximum.

Will Separate Its Lines—John J. Bukolt, who has been manufacturing Highway tire protectors in connection with his other business, the Automatic Cradle Mfg. Co., at Stevens Point, Wis., is preparing to separate the two industries. A $100,000 corporation will be formed to take over the tire appliance and accessory business, and a new fireproof factory affording 15,000 square feet of floor space will be erected. The cradle works will at once build a large addition, 82 by 150 feet, three stories high. The present combined works are employing nearly 200 men on two 10-hour shifts, and more than $3,500 worth of new machinery and tools has been contracted for to relieve the high tension caused by the extraordinary demand.

Townsend Resigns from Bowser—George A. Townsend Jr., connected with the S. F. Bowser & Co., Fort Wayne, Ind., has resigned as advertising manager of that concern, effective March 3. He has been with the Bowser company for 6 years. As yet no successor has been named.

New Concern at Davenport—The Central Auto & Tire Co., Davenport, Ia., has been organized with capital stock of $10,000 and with the following officers: President and treasurer, T. S. Kennedy, Rock Island; secretary and general manager, Otto R. Arnold. The concern will be distributor for cars and also do a general garage, supply and accessory business.

Milwaukee Steel Foundries Active—Another large corporation to manufacture electric steel has been organized in Milwaukee, Wis. It is the Pelton Steel Co., capital stock $100,000, backed by several large bankers. An electric steel foundry will be established at once. The incorporators of the new concern are Fred Vogel Jr., president, First National Bank; Gustav A. Reuss, vice-president, Marshall & Ilsley Bank, and William H. Schuchardt, architect and capitalist. The foundry will have a 3-ton furnace. Several large steel factories in Milwaukee recently have installed electric furnaces of large capacity, and Leo G. Smith, well known steel founder, is building a large

foundry, the Electric Steel Casting Co., of Milwaukee, capital stock $300,000, having been organized for this purpose. Several other founders are contemplating the purchase of electric furnaces.

Harris Made Sales Manager—Raymond W. Harris has been appointed sales manager of Gray & Davis Inc. Mr. Harris was formerly in charge of the Ford system department of the company.

McCullough Opens Two Branches—Levi McCullough, president and treasurer of the McCullough Motor Supply Co., Indianapolis, Ind., announces the opening of branch offices in both Chicago and Cleveland. The McCullough company handle the sales for eight manufacturers of parts and accessories, and the great extension of the business has made necessary the addition of more branch offices.

Firestone Dealers Meet—About 275 dealers of Firestone tires in central Ohio territory assembled at the Columbus branch February 17 in a celebration of Firestone day. The celebration was in the nature of a convention and was featured by the attendance of H. S. Firestone, president of the company. The program consisted of a reception at the Columbus branch, followed by addresses and motion pictures showing the sales convention recently held at Akron. A banquet at the Elks' Club in the evening closed the celebration.

Free Service in Rural District—The Herrick Garage and Auto Supply Co., Champaign, Ill., which introduced the free service for all cars in service in that city, now has extended the service to the country outside. Six service men are kept on duty to respond to any call for change of tires or inflation, for gasoline or other supplies, or for towing to the garage in case of breakdown. No charge is made for this service except when supplies are called for, when the same price is asked as is charged at the city supply station.

New Badger Electric Company—The Lake Superior Electrical Co., Superior, Wis., organized by M. B. Benson, to manufacture electrical apparatus, signal devices and similar appliances, has started operations in leased quarters in the plant of the Superior Iron Works, Superior, Wis. The initial force consists of forty-five electricians. The new company has established a storage battery department and has installed a complete battery charging outfit for the convenience of Superior motorists and electric car owners. Alfred L. Foster is superintendent.

New Plan for Tire Repairing—The East Rockford Tire and Vulcanizing Works, Rockford, Ill., has designed an inner tube container to be owned by motorists. Should a puncture be met with on the road at any point in Rockford or vicinity, a telephone message will bring a messenger on a motorcycle, carrying the tube in storage, and the change will be made and the tire inflated without charge. The punctured tube is returned to the shop, repaired and left in storage for the next call. The only charge will be for the customary one for repairs.

New Concern Delco Subsidiary—The Domestic Engineering Co., Dayton, O., has been granted incorporation papers with a capital of $800,000, the incorporators being Edward A. Deeds, R. H. Grant and R. D. Funkhouser. The company will take over the Delco light industry of the Dayton Engineering Laboratories Co., and will have practically the same organization as the Delco. Mr. Deeds is one of the men who are backing the project to make a model community and industrial center south of Oakwood, approximately 3,500 acres of land either having been purchased outright or secured by option for that purpose. Adam Schantz and C. F. Kettering are associated with him in this enterprise, and it has been announced that the new plant of the Delco, to be devoted to the manufacture of electric light outfits for farm and rural communities, will be built in that section.

White Leaves Lozier—W. McK. White has resigned as sales manager of the Lozier Motor Co., Detroit, Mich., to form the company of Holden & White, 320 New York Life Bldg., Chicago. This company will act as general sales agent for four manufacturers of railway supplies.

Jones Factory to K. C.—The Jones Motor Car Co., Wichita, Kan., has purchased the plant formerly occupied by the Burton Car Works in Kansas City, and will move the Jones factory there as soon as the necessary improvements can be made. The present quarters of the company will be retained as an accessory and display room.

Ford Passes Up Wichita—The Ford Motor Co. will not open an assembling plant at Wichita, Kan., as had been announced. That decision came as the result of grants made to the Ford company at Kansas City by the city council that will permit further enlargement of that plant. Between 7,000 and 10,000 cars a year would have been assembled at Wichita if the plant had been built.

Schoepflin Takes Columbia—The L. G. Schoepflin Co., Buffalo, N. Y., has taken over the entire output of the Columbia Truck & Tractor Co., Pontiac, Mich. A sales campaign will be started at once. The move divorces the manufacturing and distribution interests in the Columbia. The Columbia truck still will be manufactured by the Columbia company in Pontiac, but the Schoepflin company will act as distributer for the United States.

Board Rules Against Briscoe—The Michigan board of appeals on matters concerning foreign corporations has sustained the secretary of state, who claimed that the Briscoe Motor Corp., since its reorganization last December as a $6,000,000 concern, is an entirely new company or concern and thus must pay a franchise fee of about $3,000 to be allowed to do business in the state of Michigan. The Briscoe corporation, which paid the amount under protest, claimed that the fee should be only about $1,000 because, it further held, it is not a new company. The matter probably will be further taken up by the board at a session March 25.

Bates Tractor Business Booms—The business of the Bates Tractor Co., Lansing, Mich., during January, is reported to have been 400 per cent ahead of January, 1915. More men are being added to the force.

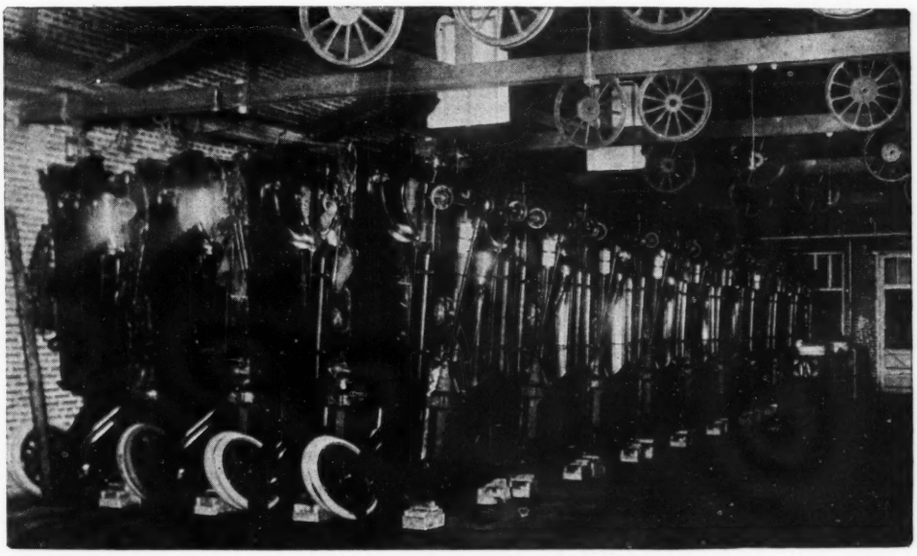
Holton Leaves Farmack—Hoover Holton has tendered his resignation as general sales manager of the Farmack Motor Car Corp., Chicago. Mr. Holton has not made known his new connection, but it is understood that it will be with a company in Detroit.

Polson Factory in Cleveland—The Polson Rubber Co., Kansas City, Mo., is putting a factory in Cleveland for the manufacture of blow out patches, Hook-on Boots, Reliners, etc. The new factory is under the personal supervision of H. B. Polson. C. A. Polson will continue in charge at the Kansas City factory.

Overland Building at Kansas City—The Willys-Overland Co. has purchased an acre tract of land at Kansas City, Mo., and will start construction work at once on a seven-story sales and storage building. The four-story building now housing the K. C. branch of the Overland company, will be sold, despite the fact that plans had been drawn and contracts let for its enlargement.

Briscoe Buys Shaft Company—The Briscoe Motor Corp. has bought the plant and business of the Jackson Motor Shaft Co., Jackson, Mich., and will take possession of it beginning July 1, 1916. The Jackson Motor Shaft Co. was the successor of the Hastings Motor Shaft Co. At the present time about 180 men are on the pay roll. Leigh C. Bloomfield, who has been connected with the company since its start, will remain as general manager.

Beloit Companies Add—The Gardner Machine Co., Beloit, Wis., manufacturing disk grinders widely used in motor car factories, garages and other shops, has made plans for an addition of the same size as the one now being completed. Both buildings will be 60 by 60 feet. The company's business has increased enormously in the last eight months, making enlargement imperative. The establishment of many garages and



TRY STANDING YOUR CAR ON ITS NOSE—Noses have a new use; that is, if you will admit that motor cars have noses. Noses have been stood upon, but seldom if ever is an owner willing to stand on his nose, even for the briefest time. Hist! Here's a secret. The DeLong Motor Co., Fithian, Ill., makes its cars get up on their noses to save space in storage. The above illustration shows how well they have been trained. In this manner the concern finds it possible to make thirty-six cars fit in where twelve fitted before. The tires, wheel and windshields are removed; otherwise the cars are not dismantled.

repair shops throughout the country has created a heavy demand for small grinders. The C. H. Besly Co., Chicago, which has works at Beloit, is also enlarging the new shop recently completed.

Stone Moves Up in Remy—G. B. Stone has been placed in charge of the Ohio-Indiana territory of the Remy Electric Co., Anderson, Indiana. For a number of years Mr. Stone has been a member of the engineering department of the Remy Electric Co., doing specialized sales work in connection with engineering.

To Handle Pathfinder Twelve—Edward A. Glab and John J. Glab, Milwaukee, Wis., have organized the Pathfinder Sales Company, to act as distributor of the Pathfinder twelve in Wisconsin and upper Michigan. John J. Glab has been associated with the Pathfinder factory for some time and will be in charge of the service department. Headquarters have been established at 163-165 Eleventh street, Milwaukee.

Organize to Distribute Marmon—The Motor Car Sales Co., Milwaukee, Wis., has been organized to act as Wisconsin distributor of Marmon cars. Temporary headquarters have been established at 136 Mason street, pending the completion of the company's own garage, which will be located in the downtown district. The concern also is Milwaukee agent for the Oakland line. Frank P. Lynch and P. B. Hustis are in charge of sales and George Kerner manager of the service department.

Heider Tractor Production Begins—The first tractor completed since the Heider Co., Carroll, Ia., consolidated with the Rock Island Plow Co., was turned out last week. For several years, the Rock Island company has been marketing the Heider product and, when the demand became so great that additional facilities were required, it was decided to consolidate, shipping facilities being improved by the change, together with many other advantages. It is hoped to turn out several thousand of the machines this year.

Ford Contract Not Upheld—The Ford Motor Car Co. filed suit against James Murdie, a farmer of Wilton, Ill., to recover a car sold to him by Fred Sipple, a dealer of Manhattan, Ill. The company maintained that Sipple secured a car from the Ford agency in Manhattan at the discount allowed dealers and then sold it to Murdie at the cut rate. When the company learned of the transaction, a suit in replevin was instituted, claiming that the dealer's contract was violated. As a new point in law was involved, considerable attention was attracted to the controversy. Lawyers for Murdie attacked the Ford contract, claiming that it was illegal and drawn up to avoid any reduction in the price. After hearing the evidence and testimony, Judge Hooper in the Will county court, handed down a decision in favor of Murdie and against the Ford company.

Duplex Power Secretary Dies—Morris J. Lamson, secretary of the Duplex Power Car Co., Charlotte, Mich., which makes the Duplex four-wheel drive truck, died a few days ago. He had been identified with the company since its start and was its first salesman.

Belknap Wagon to Increase—Belknap Wagon Co., Grand Rapids, Mich., practically will double its plant. The company makes bodies, especially for delivery purposes. It now has orders on the books for more than 250 special bodies.

Chescheir Goes to Milburn—George M. Chescheir, Louisville, Ky., who for 2 years has been southern district manager of the Waverley Electric Co., with headquarters at Washington, D. C., has resigned to become district manager of northwestern territory for the Milburn Wagon Co., Toledo, O. He will make Minneapolis his new headquarters. For several years he was connected with the Southern Motors Co., Louisville.

Shock Absorber Company Increases—The R. & R. Shock Absorber Co., Elgin, Ill., has been compelled to increase the force of employes to take care of an order for 25,000 sets of the product. or 100,000 single absorbers. This is claimed to be the largest order of the kind ever placed. As soon as the material can be secured the company can turn out 2,500 sets per week. An addition to the plant is contemplated, with further increase in the force.

To Market Illinois Car—Chiniquoy Bros. & Parker is the name of a new firm just organized in Kankakee, Ill., which will market a six-cylinder, five-passenger car with standard parts, the latter to be assembled in Kankakee and put together with certain parts to be manufactured in that city. The company has been corresponding with manufacturers of engines and other supplies, and contracts are now being written sufficient to cover a good-sized output. Should the business prove profitable, it will be enlarged from time to time.

Another Briggs-Detroiter Dividend—Creditors of the old Briggs-Detroiter Co., Detroit, Mich.. received a second dividend of 6 per cent a few days ago from the Detroit Trust Co., trustee. This makes a total of 16 per cent paid out as dividends thus far. Claims filed to date against the former motor car manufacturing concern amount to $507,433.79, but do not include a considerable amount of scheduled indebtedness for which claims have not as yet been presented. The total amount realized from the sale of all assets was $141,018 and of this $41,536.96 was paid out as preferred indebtedness against the real estate, covering the balance due on land and taxes.

Wardell Heads Detroit Steel Sales—H. F. Wardell, formerly manager of the office of the Detroit, Steel Products Co., Detroit, Mich., has been appointed general sales manager.

Chalmers Ships 157 Cars in Day—The Chalmers Motor Car Co., Detroit, Mich., on February 23 shipped 157 cars, which is the biggest shipping day it ever had. The daily average of cars shipped is 125.

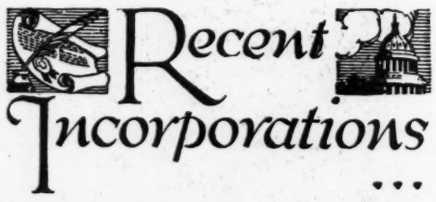
Jeffery Boosts Workers' Pay—The Thomas B. Jeffery Co., Kenosha, Wis., has increased the wages of 2,000 employes 10 per cent and reduced the working hours to 50 a week for day work and 55 hours for night work.

Auto Devices Moves—The Auto Devices Co., manufacturers of Pamco shock absorbers and several other specialties, has removed from 3027 Locust street to a larger building at 3214 Locust street, St. Louis, Mo.; and with enlarged manufacturing facilities, largely will increase its output.

Saxon February Shipments 2,500?—Shipments for February by the Saxon Motor Co., Detroit, Mich., will show an increase of nearly 200 per cent compared with February, 1915, the total number of cars expected to be shipped by the end of February 29 being estimated by officials at more than 2,500.

Pullman Upholsterers Strike—Some difficulty was encountered February 25 by officials of the Pullman Motor Car Co., York, Pa., when thirty employes of the upholstery department went on strike. The men demand a fixed wage scale for this department with a minimum of 35 cents for mechanics and 22½ cents an hour for men working under instructions. An official of the company stated that the demand of the men would not be granted. The company is unusually busy and, it is said, if the men refuse to return to work, operations of the plant will be seriously handicapped.

Timken Has Tube Plant—At an expenditure of about $500,000 the new seamless steel tube plant of the Timken Roller Bearing Co., Canton, O., recently was completed and now is being operated 24 hours a day. It is one of the most complete mills in the world. There will be other steps taken further to increase the quality of the Timken product, as well as to make possible larger outputs. Owing to the war the foreign source of supply of tubing practically has been cut off, and it was to some extent a necessity for the company thus to put up its own tube plant. This will further protect its product as to quality and also lead to greatly increased production possibilities.



Brooklyn, N. Y.—Eureka Rubber Mfg. Co.; to manufacture rubber goods; capital stock $30,000; incorporators, R. Goodman, H. Hyman, A. C. Squires, S. Benjamin.

Chicago—The Kimback Auto Sales Co.; capital stock $7,500; to manufacture and deal in motor cars; incorporators, T. E. Tietz, C. J. Goodman and R. J. Henry.

Chicago—R. H. Green & Co.; capital stock $20,000; to deal in motor cars and other vehicles; incorporators, R. H. Green, R. H. O'Connor and G. J. Gardner.

Chicago—Louis J. Sheland Co.; capital stock, $2,500; to manufacture and deal in motor vehicles and accessories; incorporators, L. J. Sheland, C. J. Anderson and R. E. Genzel.

Chicago—Pelletts Magneto Co.; capital stock $50,000; to manufacture and deal in motor cars and battery driven vehicles; incorporators, J. C. Slade, A. L. Hall and N. P. Trimborn.

Chicago—Bentley-Eves Rubber Co.; to manufacture and deal in tires, casings and tubes; capital stock $15,000; incorporators, W. A. Bentley, R. O. Physioc, H. L. Bluim.

Chicago—Harry Newman, Inc.; capital stock $20,000; incorporator, S. E. Comstock.

Cleveland, O.—Auto Lamp & Radiator Co.; to deal in motor car accessories; capital stock $10,000; incorporators, R. H. Lee, W. J. Patterson, G. V. Stuart, B. N. Helgen, C. M. Gallagher.

Cleveland, O.—Besaw Quality Tire Co.; to deal in motor car tires; capital stock $15,000; incorporators, C. J. Herr, M. J. Herr, W. O. Bayer, W. Gardner, Jr.

Detroit, Mich.—De Palma Mfg. Co.; capital stock $100,000; to make motors, etc.; incorporators, Ralph de Palma, Frank P. Book and J. B. Book, Jr.

Detroit, Mich.—Sinclair Garage, Inc.; capital stock $5,000; incorporators, R. R. Sinclair, H. M. Sinclair, F. W. Draper.

East Liverpool, O.—Travelers Garage and Sales Co.; capital stock $10,000; incorporators, Wm. F. McGinigal and others.

Jackson, Mich.—Parrott Tractor Co.; capital stock $30,000.

Milwaukee, Wis.—J. B. Erwin, 78 Loan & Trust building; capital stock $25,000; incorporators, J. B., O. R. and L. B. Erwin.

Milwaukee, Wis.—The Green Bay Avenue Garage Co.; capital stock $25,000; incorporators, Otto Ladwig, Walter O. Ladwig, Alfred A. Ladwig and Otto A. Ladwig, Jr.

Muncie, Ind.—Werner Co.; to deal in motor car parts; capital stock $10,000; incorporators, N. L. Werner, A. C. Lipsitz, L. D. Panghorn.

Muskegon, Mich.—Enterprise Brass Works; capital stock $175,000.

New York—Mineralized Rubber Mfg. Corp.; capital stock $100,000; incorporators, T. E. Larson, S. G. Worthen, H. T. Randell.

Oakfield, Wis.—The Ewald Works, capital $20,000; to deal in cars and trucks; Arno E. Ewald, general manager.

Richmond, Va.—Grant Motor Car Corp.; capital stock $4,000,000; incorporators, R. W. Andrews, E. Munster, L. R. Miser.

Rosslyn, Va.—Mutual Automobile Supply Association, Inc.; capital stock $25,000; incorporators, C. R. Pritchard, H. W. Pettit.

Sandusky, O.—Continental Rubber Co.; to manufacture tires and rubber specialties; capital stock $300,000.

St. Paul, Minn.—General Manufacturing Co.; capital stock $250,000; incorporators, F. Patterson. J. Oswald, C. E. Jury.

Waynesville, O.—Waynesville Auto Storage Co.; to operate a garage; capital stock $3,500; incorporators, C. E. Thomas, H. M. Sherwood, J. B. Chapman, J. T. Ellis, C. H. Sherwood.

Wilmington, Del.—Aluminum Rubber & Tire Co.; capital stock $1,000,000; incorporators, F. L. Buehler, L. S. Dorsey, K. M. Dougherty.